Solid State Logic

AWS 900+

Owner's Manual

82S6AWS030A

Solid State Logic
SOUND | | VISION

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E&OE

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Section 1 – Important Information

This section contains important information; please take a few minutes to study it before you attempt to install or use your AWS 900+.

THESE INSTRUCTIONS ARE REQUIRED FOR COMPLIANCE WITH UL60065

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles and at the point where they exit from the apparatus.
11. Unplug this apparatus during lightning storms or when unused for long periods of time.
12. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.
13. Adjustments or alterations to the equipment may affect the performance such that safety and/or international compliance standards may no longer be met. Any such adjustments must therefore only be carried out by fully trained personnel.
14. This equipment is designed for use solely by engineers and competent operators skilled in the use of professional audio equipment.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

CAUTION: AWS900+ is too heavy for one person to lift. If trim is removed during handling (to prevent damage or to reduce the size) sharp edges may be present on exposed metalwork.

Graphical Symbols

The following symbols may be used in this manual.

General hazard – refer to user or service manual for details.

Electrical hazard.

Installation Instructions

The AWS 900+ is supplied with a 3-core AC power cord and must be connected to a 3-pin grounded supply.

If the available AC power supply includes a ground connection, then AWS900+ may simply be connected to the supply and is ready to operate.

The power cord should be protected by a fused plug, fused spur or circuit-breaker according to local practice: 5A for 230V supplies; 10A for 100–110V supplies

If only a 2-pin supply is available, AWS900+ must be installed by a qualified electrician according to local regulations to ensure that the metal chassis is permanently earthed and must only be used with single-phase supplies with the neutral conductor at earth potential – category TN. AWS900+ must not be used with TT or IT category supplies.

CE Certification

Note that any cables supplied with SSL equipment may be fitted with ferrite rings at either end. This is to comply with current European CE regulations and these ferrites should not be removed.

If any of the console metalwork is modified in any way – particularly the addition of holes for custom panels etc. – this may the adversely affect the CE certification status of the product.

FCC Certification

This equipment has been tested and found to comply with the limits for a ‘Class A’ digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This product is intended to form an integrated component part of a professional audio recording, mixing, dubbing, film, TV, radio broadcast or similar studio wherein it will perform to specification providing that it is installed according to professional practice.

Servicing Instructions

Caution

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing unless you are qualified to do so.

Disconnect the power cord before removing panels or modules. The power switch alone does not provide adequate isolation for service access.

Do not permit anyone other than qualified service personnel to operate the equipment unless all panels and modules are in place.

CAUTION: When working on AWS900+ with power applied, when cover panels or audio-modules are removed, HAZARDOUS CONDITIONS MAY EXIST.

These hazards include:
- High voltages
- High energy stored in capacitors
- High currents available from DC power busses
- Hot component surfaces.

CAUTION: AWS900+ may contain a lithium battery (CPU assembly 629645). There is a danger of explosion if the battery is incorrectly fitted. Replace only with the same or equivalent type

CAUTION: To reduce the risk of fire, only replace internal fuses with identical type and rating

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown here is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

About this manual

This manual is divided into six main sections, and is designed to provide a comprehensive source of information for both installers and users of the AWS 900+ console. The table of contents will help you to familiarise yourself with the basic content of each section. If you are reading this from an electronic version of the manual, use the 'bookmark' feature to locate to any topic almost immediately.

Please read the opening pages of Section 3 before attempting to install the console, particularly the warnings about lifting and positioning the console.

If you have not previously used an SSL console, you are advised to read an introduction to the AWS 900+ in Section 2. Those of you who have experience of SSL's legendary range of analogue consoles will have little difficulty getting to grips with the operation of this console. Features that are specific to the AWS 900+ are fully described in Section 4.

To set-up and configure the software interface between the AWS 900+ and your chosen DAW, please study Section 5. This section also covers those DAW functions that you can now usefully control from the AWS 900+ centre section.

Finally, the last section in this manual holds a number of useful appendices that you may need to refer to from time to time.

Conventions Used

Some typographical conventions have been used in this manual to help distinguish explanatory text from the text referring to items on the console. They are as follows:

- Switch cap engravings on the console are usually in **UPPERCASE** (eg. **SOLO**).
- Silk screened text on the console's control surface can be either UPPERCASE (eg. DYNAMICS), or **lowercase bold** (eg. **auto**), or **Titlecase** (eg. **Talkback Mix**).
- Any text on the console's TFT screen is referred to in a Bold typeface.
- *Items of note or cautions are shown in a red italic typeface.*
- Whenever this manual mentions the selection or pressing of a button, it is assumed that the button was not active (ie. not lit), and that this action has made it active (ie. it has become lit).
- Similarly, whenever the manual mentions the deselection of a button (or pressing it again), it is assumed that it was active before the action, and has become inactive due to this action.

Contacting Solid State Logic

If you cannot find the information you need on the pages of this manual, please see the AWS 900+ support pages at http://www.solid-state-logic.com

Section 2 – Introduction

the AWS 900+ – Analogue Workstation System

The AWS 900+ is a revolutionary combination of a compact world-class analogue mixing console and a comprehensive DAW controller. Based on SSL's flagship XL 9000 K Series console, the AWS 900+ provides everything you need to record, edit and mix professional projects – just add the workstation of your choice.

Solid State Logic mixing systems are the de facto standard in audio production, valued for their unrivalled audio quality and control ergonomics. SSL was the first company to integrate automation and machine control into the mixing console, and it pioneered surround mixing. The AWS 900+ delivers the same powerful integration benefits to DAW users, who face similar challenges with an array of equipment (Mic Amps, Effects, Controllers etc.) to produce professional results from a modern DAW.

Design Concepts

The AWS 900+ is the only console that provides the dual benefits of a fully featured SuperAnalogue signal path, coupled with a comprehensive DAW controller. The product is a result of extensive customer and market feedback.

Key Features Summary

- Combined SSL console and DAW controller
- Legendary SSL SuperAnalogue™ mic preamps and signal processing
- Comprehensive monitoring system up to 5.1 surround
- Direct control of DAW recording, editing and mixing functions
- Flexible signal routing

SuperAnalogue™ Audio Quality

The AWS 900+ is a complete, compact SSL console, with all of the audio quality, robustness and advanced ergonomics that this implies. AWS 900+ offers no-compromise audio performance, equivalent to SSL's celebrated XL 9000 K Series mixing console, which is a feature of major studios the world over.

Signal routing, inputs/outputs, monitoring and signal processing are all permanently available on the console. Quality motorised faders provide conventional audio level control as well as controlling the recording and replay levels in your DAW.

Console Feature Summary

- Integrated console, signal acquisition, signal processing, studio monitoring, bass management and DAW control
- Advanced DAW control through a high resolution integrated TFT screen
- Small elegant design with desk installation or freestanding options
- Innovative new large fader dual-control of both DAW and console input path with follow fader metering

Exceptional Signal Processing

- Legendary SSL sound quality
- SuperAnalogue™ technology derived from SSL's flagship XL 9000 K Series console
- DC Coupled for excellent low frequency response
- Balanced signal paths throughout for optimal dynamic range
- Greater bandwidth than 192kHz recorders
- 24 Ultra low-noise dual impedance mic amps
- 24 channels with twin-curve SSL E and G Series 4-band parametric equalisation
- Assignable dynamics sections with gate, expander and compressor/limiter
- G Series stereo mix buss compressor
- Flexible processing order

Creative Versatility

- Dual mix bus design for comprehensive control of Inputs and DAW mixing and monitoring
- 5.1, stereo or stereo down-mix main outputs
- 8 Track busses
- Two main busses – Record and Mix
- 8 aux busses plus EFX re-assign system on all 24 channel modules
- Wide range of solo modes including Solo-In-Front
- 4 stereo echo returns
- Unrivalled comprehensive studio monitoring section
- Hi-visibility channel meters, 4 main VU meters and complete bus metering in the centre section

DAW Controller

DAWs provide the power and convenience of recording and editing audio, but a keyboard and mouse is not the most intuitive way to access these controls. For most users, finding an integrated solution that answers all of their working needs is strongly desired. The AWS 900+ achieves this to an extent and quality that has previously been unavailable.

Controller Features Summary

- Direct access to all major DAW mixing, editing and automation parameters
- Direct control of plug-in settings
- Dedicated control processor to maximise console performance
- Integral colour TFT display with dedicated control keys
- User-definable controls on every channel
- High quality motorised faders to write/replay level moves in your DAW
- Simple switching between console layer and DAW control layer
- Full remote control implementation
- Operation independent of platform – works with ProTools™, Nuendo™, Logic Audio™, and many more

Enjoy.....

Section 3 – Installation and Setup

Pre-Installation Requirements

Console Control Surface

The AWS 900+ console is a self contained system; there are no remote power supplies or I/O racks. The frame is not fitted with cooling fans. See the following page for a drawing of the console footprint.

Air Conditioning Requirements

It is unlikely that additional air conditioning will be required after installing the AWS 900+ (with its typical 450W dissipation). It is possible however, that when all the studio equipment is taken into consideration, particularly if additional lighting is being installed, the combined heat output could be sufficient to cause the temperature to rise to uncomfortable levels. The appendix section contains environmental specifications for SSL equipment.

Cable Ducting

Cable ducting may be required between the console and any outboard racks and the recording areas. If a full remote patchbay is being provided then the ducting will need to be of sufficient size to allow at least twelve 24-circuit multicore cables to be accommodated.

Service Access

Access to all electronic assemblies within the frame is from the front of the console. Note however, that each of the console's modules is retained by a screw through its rear panel. Is necessary therefore, to have access to the rear of the console.

Power Connections

The console is fitted with auto-sensing power supplies which will function at any voltage from 90 to 250 volts without adjustment. It is supplied with two IEC mains power-leads. One will have a US-style 3-pin mains plug fitted, the other will be unterminated to allow the user to install a mains plug of their preferred type; the wires are colour-coded according to the EC standard.

Grounding

A standard system should not require any *additional* grounding over and above that provided by a correctly installed mains supply. The console's chassis is permanently bonded to mains earth.

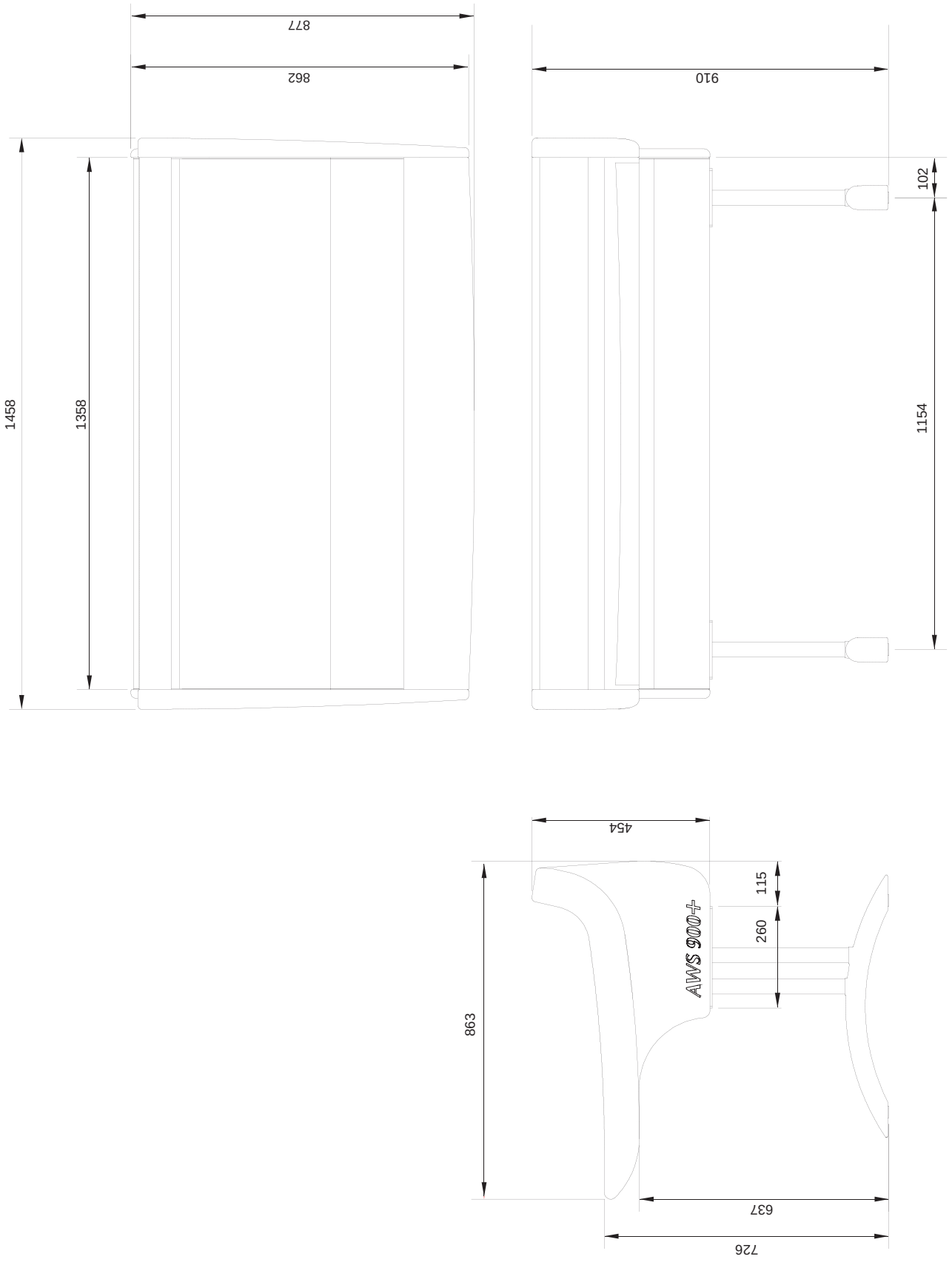
Safety Warning: The mains input ground wire MUST be connected to the supply earth.

Thermal Considerations

The maximum dissipation of an AWS 900+ is less than 600W (typically 450W). The console is cooled by convection from the front inlet (in the knee panels) to the exit at the top of the rear panels. It is very important that these ventilation grills are not obstructed in any way.

Particular care must be taken when considering the installation of studio furniture – such as shelving – across the rear of the console. Sufficient space *must* be left for the free flow of air from the rear grills, and also above the heatsink fins. Clearance behind the console must not be less than 50mm and clearance above the console not less than 200mm.

Note: The heatsink fins on the console rear panels can reach temperatures of approximately 30 degrees Celsius above ambient room temperature.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260
AWS 900+
863
637
726

Unpacking The Console

IMPORTANT SAFETY INFORMATION

The weight of an AWS 900+ console is approximately 112Kg, (or 100Kg with the legs removed). Please ensure that sufficient labour is available during removal of the console from its packaging, and when moving the console into position. It is recommended that at least four people are available when lifting.

The AWS 900+ is supplied in a wooden crate with the legs in a smaller separate crate.

Using a large screwdriver or pry-bar carefully open the crate containing the console. The crate is not designed to be reusable so does not have to be removed intact. With the crate sides removed there will be sufficient space for four people to lift the console clear from the base of the crate.

Note: The console is shipped with its trim fitted, avoid using the trim as a lifting point. Do not lift the front of the console by using the buffer alone.

Attaching the legs

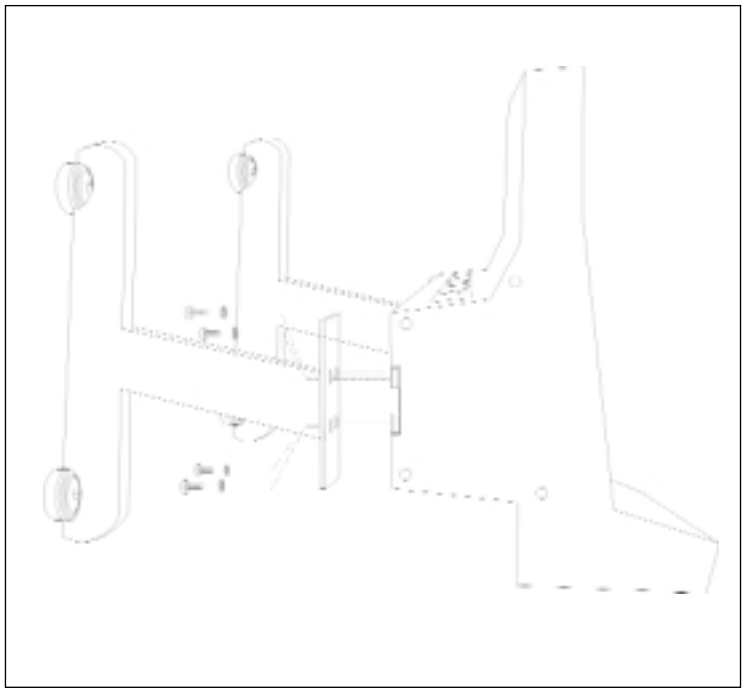
Again, it is recommended that four people are available to perform this operation

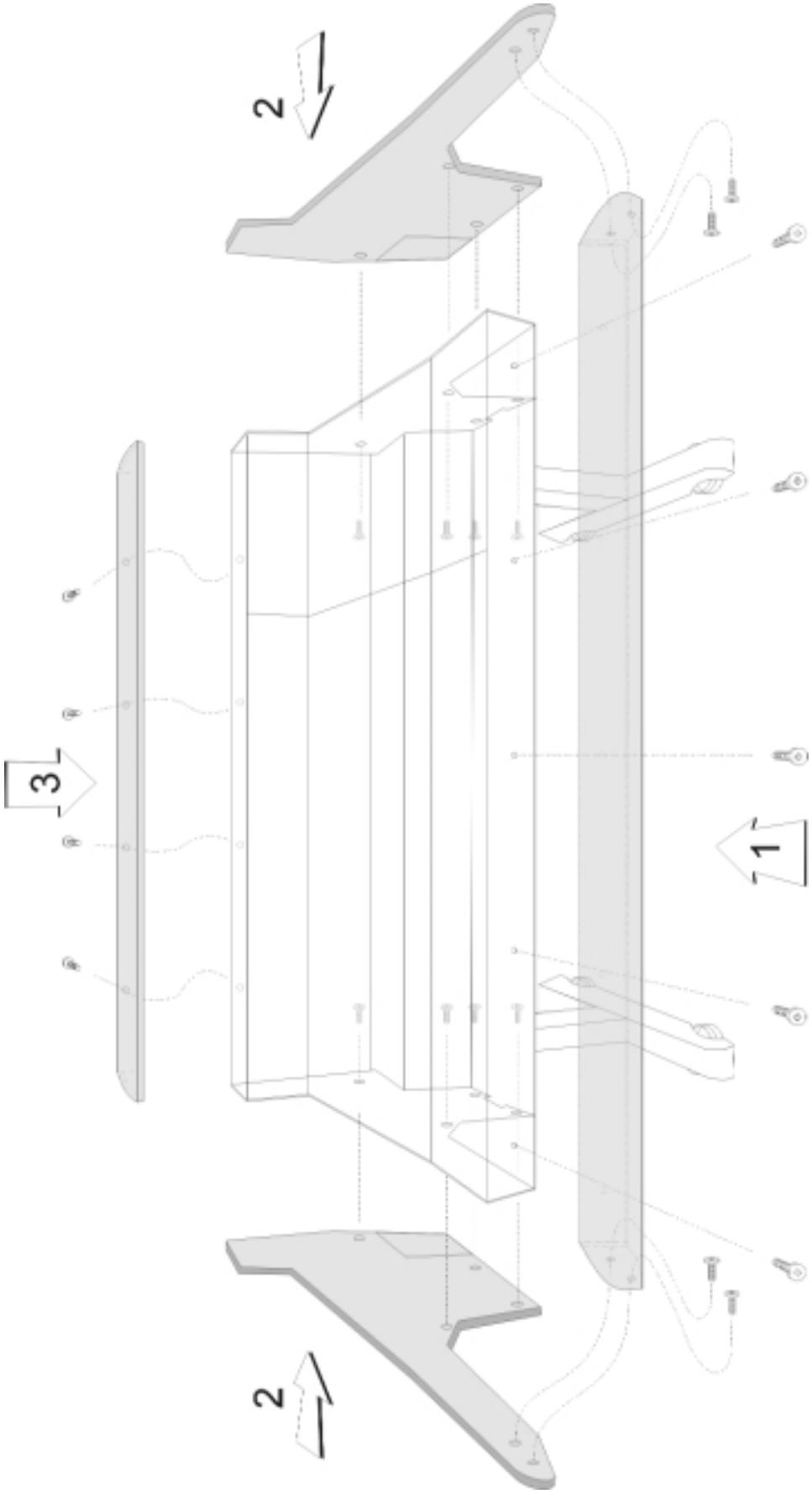
The bolts required to attach the legs are shipped in the same crate as the legs. A 6mm hex-key is provided as one of the tools included in the AWS 900+ console crate.

The console should first be rolled onto its back. Ensure that ample padding is provided – such as blankets or bubble-wrap – to support the rear panels (the PSU heatsink fins protrude from the rear of the console, and care must be taken not to damage them).

Position the legs on the console beam and attach the M10 bolts using the 6mm hex-key supplied. There are four bolts per leg.

Using four people, the console may now be tipped forward onto its feet. When the console is in position, the feet can be slightly adjusted to compensate for an uneven floor. Do not unscrew the feet by more than 15mm.




2
3
1
2

Removing the trim

If it is necessary to remove the trim panels – to adjoin existing furniture – then please refer to the following information and the illustration shown on the facing page.

Note that it is not necessary to remove any of the audio modules to gain access to the trim fixing screws.

Front Buffer

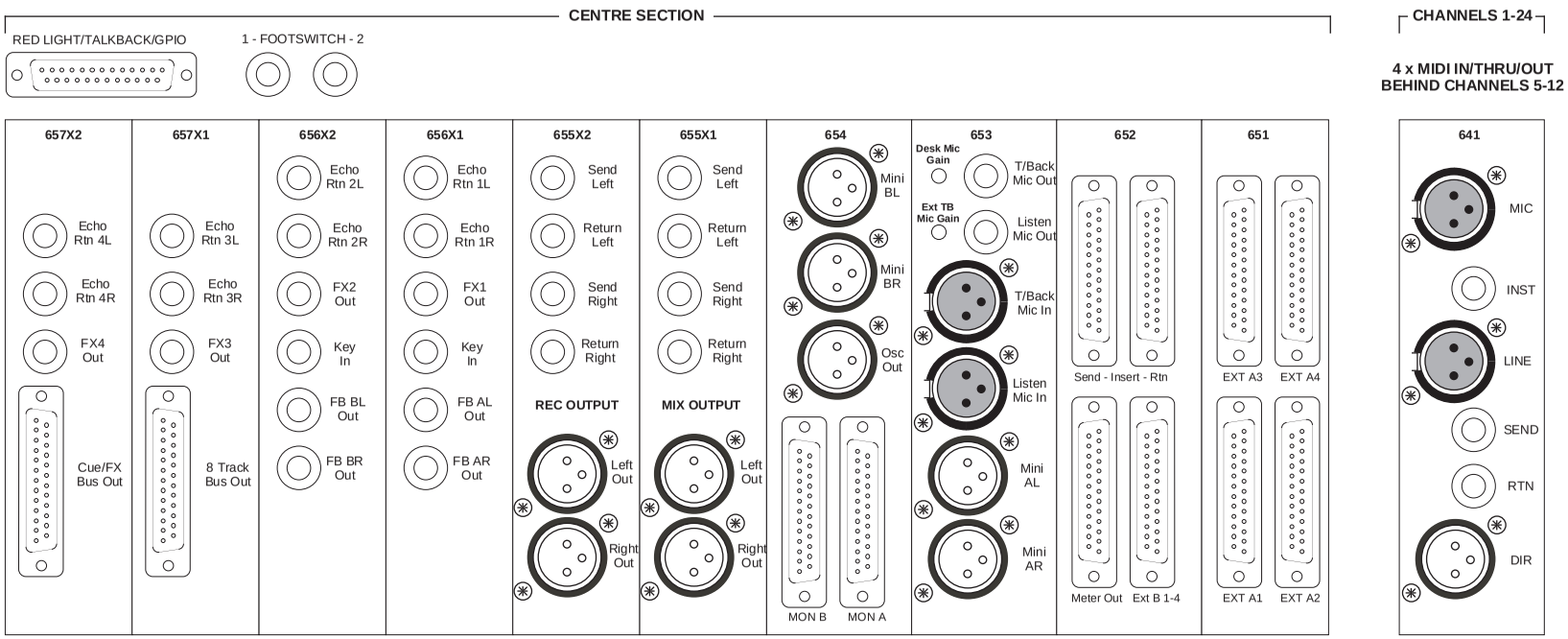
The front buffer is secured by nine pan-head screws – five in the front beam and two in each end trim. These are all visible from beneath the buffer.

End Trim

Each of the end trims is secured by four countersunk Posi-head screws through the profile (one is located in the kneepanel area, two more are found either side of the main beam and the fourth is located on the bottom corner of the outside profile), as well as two pan-head screws through the front buffer (visible from beneath the buffer).

Top Trim

The top trim is clipped over the front of the meter panels and secured onto the back panels by four M3 screws.



Red Light/Talkback/GPI/O

Connector Type: 25-way D-type female

Pin	Ribbon pin	Description	Notes
1	5	Red Light Relay contact A	*Normally open*
14	6	Red Light Relay contact B	*Follows Red Light switch*
2	7	0V	
15	8	GP Input 1 (not used)	
3	9	GP Input 2 (not used)	
16	10	Monitor Cut	*Forces Cut when active*
4	11	Monitor Dim	*Forces Dim when active*
17	12	Slate switch	
5	13	Listen switch	
18	14	Red Light switch	
6	15	TB All switch	
19	16	FB A switch	
7	17	FB B switch	
20	18	Ext TB switch	
8	19	+4V	*Max current 200mA(fused)*
21	20	Slate Tally	
9	21	Listen Tally	
22	22	Red Light Tally	
10	23	TB All Tally	
23	24	FB A Tally	
11	25	FB B Tally	
24	26	Ext TB Tally	
12	27	n/c	
25	28	n/c	
13	29	n/c	

All inputs are active low (ie connect to 0V to activate). Inputs are pulled up to +4V via 3K9 resistor
Inputs are diode clamped to 0V and +4V to protect the console circuitry
All tallies are open collector with 47R series resistor.

AWS Audio 25wD pinouts

Connector Type: 25-way D-type female

cct	Hot	Cold	Screen	EXT A Inputs 1-4	Meter Out	Ext B Inputs	Mon Insert Send	Mon Insert Return	Mon A	Mon B	8 Track Out	Cue/FX Out
1	24	12	25	Left	Left	1 Left	Left	Left	Main Left	Alt Left	Bus 1	Cue AL
2	10	23	11	Right	Right	1 Right	Right	Right	Main Right	Alt Right	Bus 2	Cue AR
3	21	9	22	Centre	Centre	2 Left	Centre	Centre	Main Centre	Alt Centre	Bus 3	Cue BL
4	7	20	8	LFE	LFE	2 Right	LFE	LFE	Main LFE	Alt LFE	Bus 4	Cue BR
5	18	6	19	Left Surround	Left Surround	3 Left	Left Surround	Left Surround	Main Left Surround	Alt Left Surround	Bus 5	FX1
6	4	17	5	Right Surround	Right Surround	3 Right	Right Surround	Right Surround	Main Right Surround	Alt Right Surround	Bus 6	FX2
7	15	3	16	n/c	Solo Left	4 Left	Lt to Decoder	Lt From Encoder	Mini AL	Mini BL	Bus 7	FX3
8	1	14	2	n/c	Solo Right	4 Right	Rt to Decoder	Rt from Encoder	Mini AR	Mini BR	Bus 8	FX4

TRS Jack.
Instrument and Footswitch inputs Tip = Hot, Sleeve = screen
All other jacks Tip = Hot, Ring = Cold, Sleeve = screen

XLR Male
Pin 2 = Hot
Pin 3 = Cold
Pin 1 = Screen

XLR Female
Pin 2 = Hot
Pin 3 = Cold
Pin 1 = Screen

Solid State Logic

AWS Connector Panel Layout

© Solid State Logic

Drg. No:	
Rev:	1.4
Date:	22/03/06
Design:	AWS 900+
Drawn:	SD/GC
Ref:	Connector Panel

Studio Integration

Audio Connections

All connections to the AWS 900+, with the exception of the two headphone jacks, are found on the lower rear panels of the console. The headphone sockets are located on the centre-section knee panel.

The console rear panel carries a label which identifies all the connections on the connector panel, and provides the pinout for each one (see facing page). This information is also provided in the Appendices section of this manual.

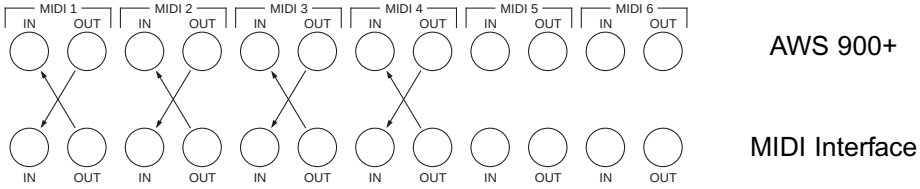
DAW Connection

The AWS 900+ console communicates with a DAW directly via three high-speed MIDI ports. Using this method of communication allows the AWS 900+ to be used with a wide variety of DAW applications on a wide variety of platforms. The AWS 900+ uses a 'HUI' compatible protocol, and so any DAW program that can be configured to use three HUI devices can access the full power of the AWS 900+.

Please refer to your DAW manual for details on how to configure the DAW application for AWS 900+ control.

Connection and Setup

Physical connection between the AWS 900+ console and your DAW system is very simple. The console communicates with the DAW via the MIDI ports located on the rear of the console:



MIDI ports should be connected to your DAW MIDI interface unit – three available ports are required (one port includes an IN and OUT socket). To connect a port, the output of the MIDI interface unit port 1 should connect to the **MIDI 1** input port of the AWS 900+. Also, the MIDI output of the AWS 900+ port 1 should connect to the input of your MIDI interface unit port 1. Repeat for the other ports using the diagram above as a guide.

Note that ports 5 and 6 are currently not implemented and are reserved for future expansion.

Please note that the recommended maximum length of MIDI cables is 15 metres.

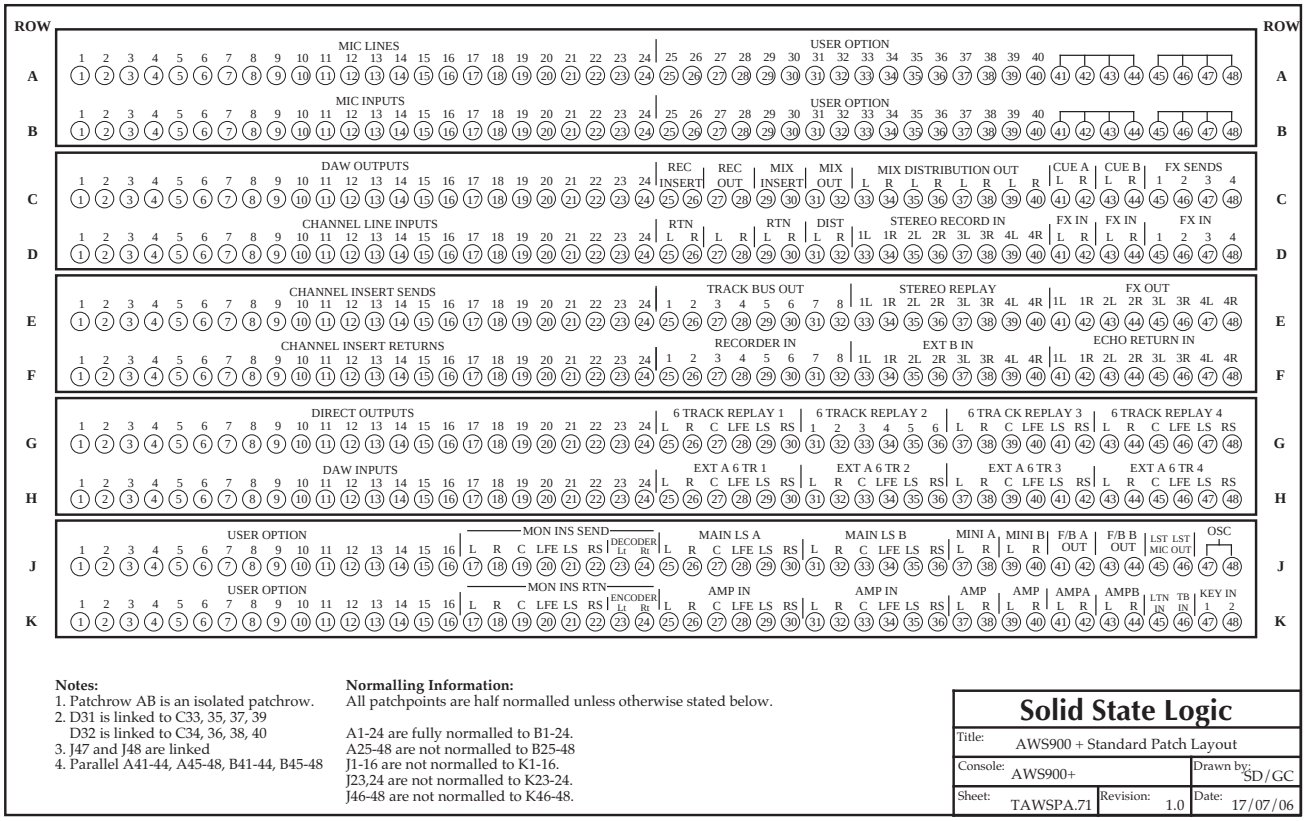
Other MIDI connections

If your system is fitted with Total Recall you should also connect AWS 900+ MIDI port 4 to an unused port on the DAW MIDI interface.

Connecting a Patchbay

The AWS 900+ may, of course, be fully or partially integrated to an external patchbay. 3rd party options are available, and SSL can provide patchbay solutions as cost options – contact your local SSL distributor for further information.

An example patch layout for the centre section and channels is provided below:



Notes:
1. Patchrow AB is an isolated patchrow.
2. D31 is linked to C33, 35, 37, 39
   D32 is linked to C34, 36, 38, 40
3. J47 and J48 are linked
4. Parallel A41-44, A45-48, B41-44, B45-48

Normalling Information:
All patchpoints are half normalled unless otherwise stated below.

A1-24 are fully normalled to B1-24.
A25-48 are not normalled to B25-48
J1-16 are not normalled to K1-16.
J23,24 are not normalled to K23-24.
J46-48 are not normalled to K46-48.

Solid State Logic		
Title: AWS900 + Standard Patch Layout		
Console: AWS900+		Drawn by: SD/GC
Sheet: TAWSPA.71	Revision: 1.0	Date: 17/07/06

When constructing patchbays, the following guidelines may be useful.

Mic Inputs

If Mic inputs are being connected to a patchbay, then the patch jacks should be insulated from the main body of the patchrow. There are commercially available patchrows that meet this requirement. The ground connection from each microphone must be taken through the patch jacks to the XLR on the back of the console without interruption.

Instrument Inputs

It is not recommended that the 'Instrument' inputs are broken out to a patchbay. These inputs are unbalanced, and the cable lengths should be kept at short as possible.

Line Level Input/Outputs

All other analogue inputs and outputs can be connected via a patchbay. It is recommended that the cable shield is connected at the console end and disconnected at the patch row to avoid ground loops. Wiring to the installation should normally have the shield connected to the patch row. The shield connection of all jacks should be linked together (note that patch rows with solid metal front panels will automatically do this) and then linked to a common star point on the patchbay. This starpoint can then be returned – via a thick grounding cable (6mm sq. or greater) – to the chassis stud on the rear of the AWS 900+ console. This will reduce the risk of earth loops within the installation.

Note that the shields of all analogue inputs and outputs other than the microphone inputs are connected directly to the chassis of the AWS900+.

Section 4 – Console Operator's Guide

Overview

The AWS 900+ is a powerful new combination of analogue console and workstation controller from Solid State Logic. It draws on many years of design experience, and incorporates many features from SSL's world famous music consoles.

The AWS 900+ uses SuperAnalogue™ technology from SSL's flagship music console, the XL 9000 K Series. The AWS 900+ retains all of its sonic benefits and maintains a control surface that will be familiar to any recording engineer who has previously used our 4000 or 9000 range of analogue audio consoles.

The rise of the DAW (Digital Audio Workstation) has brought many benefits to the audio production environment, including electronic editing, integrated digital effects processing and session storage and recall.
However, the same problems of integration that have always existed still exist within the studio environment today. A studio requires either 5.1 or stereo monitoring in order to accurately monitor audio signals. The DAW will have no faders or tactile controls with which to operate its myriad of functions, so a comprehensive control surface is required. High quality microphone pre-amplifiers will be needed to capture real sounds with the highest possible signal integrity for high bandwidth DAW recorders operating at 192kHz. Equalisation and dynamics are required in the analogue domain by many users who still consider analogue the benchmark to which all digital processing is compared. Meters are required to view both input/output signals and recorded signal levels for all audio paths.

The AWS 900+ console has been carefully designed with all of these essential studio requirements in mind. It addresses all the needs of the current DAW environment in an integrated, high quality and robust design with all of the sonic benefits expected from a Solid State Logic SuperAnalogue™ console.

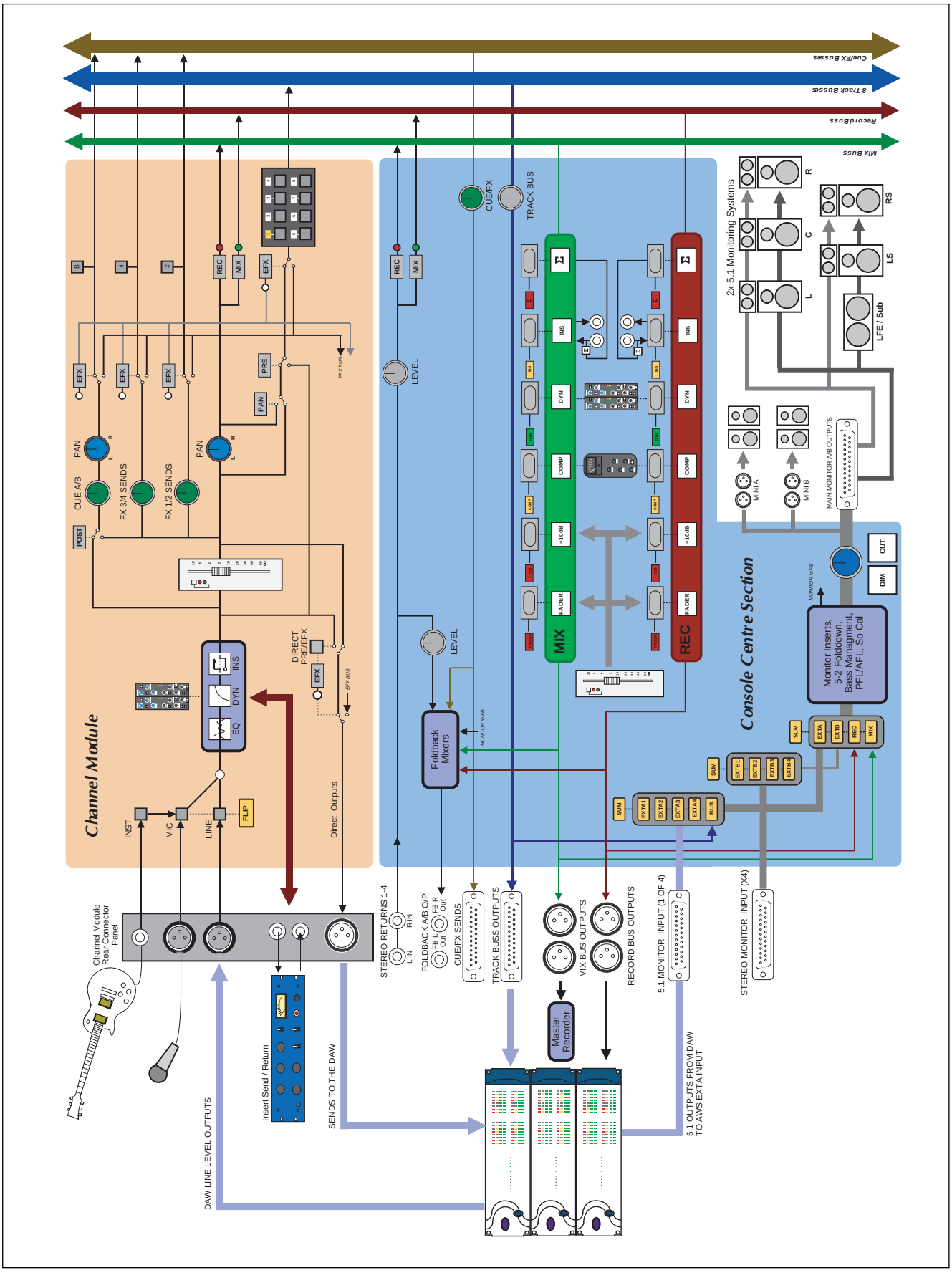
Years of design experience have been utilised to create the ultimate capture path for up to 24 simultaneous input paths into the DAW, where recorded signals can be edited, processed and mixed via the AWS 900+ control surface. The signal paths can then be either summed internally within the DAW or returned to the analogue domain for processing through the 24 SSL EQ sections and associated assignable dynamics processors. Combined with a comprehensive 5.1 monitoring section, audio can be auditioned with complete assurance that the fully balanced signal path throughout the console is of the highest possible audio integrity.

A high resolution digitally controlled gain element in each channel allows the 24 motorised faders to be switched to control any DAW that supports the HUI protocol while retaining the analogue signal path. The 24 faders and the 24 associated Channel Rotary Encoders provide direct control of DAW faders, pans, sends, input and output routing. The Master Control Panel and the in-board screen give paged control of all plug-in parameters.

In summary, the AWS 900+ is a **Total Studio Solution** for modern DAW based production environments.

About This Section

This section comprises two main parts. First there is an overview of how your DAW and the AWS 900+ can be used together. Following this is a description of the function of each part of the console. The use of the DAW controller section is covered in Section 5.


Cue/FX Busses
8 Track Busses
Record Buss
Mix Buss
Channel Module
Console Centre Section
2x 5.1 Monitoring Systems
L
C
R
LS
RS
LFE / Sub
MAIN MONITOR A/B OUTPUTS
MINI A
MINI B
CUT
DIM
Monitor Inserts,
5-2 Folddown,
Bass Managment,
PFL/AFL Sp Cal
MONITOR to FB
CUE/FX
TRACK BUS
LEVEL
REC
MIX
EFX
PRE
PAN
CUE A/B
FX 3/4 SENDS
FX 1/2 SENDS
POST
INS
DYN
EQ
FLIP
INST
MIC
LINE
DIRECT PRE/EFX
EFX BUS
Direct Outputs
Foldback Mixers
FADER
COMP
+10dB
MIX
REC
SUM
EXTA
EXTB
EXTA1
EXTA2
EXTA3
EXTA4
BUS
EXTB1
EXTB2
EXTB3
EXTB4
Channel Module Rear Connector Panel
STEREO RETURNS 1-4
L IN
R IN
FOLDBACK A/B O/P
L Out
R Out
CUE/FX SENDS
TRACK BUSS OUTPUTS
MIX BUS OUTPUTS
RECORD BUS OUTPUTS
5.1 MONITOR INPUT (1 OF 4)
STEREO MONITOR INPUT (X4)
Master Recorder
Insert Send / Return
SENDS TO THE DAW
DAW LINE LEVEL OUTPUTS
5.1 OUTPUTS FROM DAW
TO AWS EXTA INPUT

Routing and Signal Flow

In order to understand signal flow through the AWS 900+'s various operational modes, first we need to discuss how your DAW I/O unit is connected to the AWS 900+ console. Unlike a conventional in-line console the AWS 900+ does not have a separate monitor path. Instead the DAW mixer is used to create a monitor mix (or mixes), with levels controlled from the AWS 900+ faders or rotary encoders. It is even possible to use the fader to control the analogue input level and the rotary encoder to control the DAW monitor mix levels, mimicking the operation of an in-line design. Following are a few possible connection schemes - many others are possible.

DAW System Configurations

The largest variable when dealing with DAW studio configurations is the amount of analogue I/O (Inputs/Outputs) or AD/DA converters that will be used to interface the AWS 900+ to your DAW. Standard studio configurations will vary between 2 and 32 (or even more) I/O systems. How many channels you require will depend on how you intend to use the system.

The following guidelines are intended to help when designing your system. Feel free to ignore them if they don't work for your application.

- The DAW mix bus should be connected to an external input to the monitor system. This will allow you to monitor the DAW mix and easily feed it to the foldback outputs. External A is 5.1, External B is stereo.
- If your main mix is 5.1 also connect a stereo output to the External B monitor selector so you can feed a stereo mix from your DAW to the console for headphone mixes.
- If you do not have many DAW outputs then also connect these outputs to line inputs on the console so you can easily mix the DAW outputs with other inputs.
- If you would like to mix in the analogue domain then you should connect as many DAW outputs as practical to the AWS 900+ line inputs. By using these as track outputs you can mix smaller projects entirely in the AWS 900+. Larger projects can use the AWS 900+ as an analogue submixer or to combine DAW sub mixes.
- Connecting the Record bus outputs to two DAW inputs will allow you to quickly route any analogue channel to any track on the DAW.
- If you only have a limited number of DAW inputs then connecting the Track bus outputs to DAW inputs will allow several analogue inputs to be routed simultaneously to different tracks without patching.
- If you have a large number of DAW inputs then connecting them to the channel direct outputs will give a very short record path.

2 Channel DAW System

Even with only two DAW analogue inputs and outputs the AWS 900+'s routing flexibility can greatly simplify your work flow. Connect the Record Bus outputs to the DAW analogue inputs, allowing any channel on the console to be routed directly to the DAW. Connect the DAW outputs to stereo External B input three (which is labelled DAW) on the AWS 900+ to allow the DAW output to be monitored and to used as a part of the foldback mix. You may also want to connect the DAW outputs to two of the channel line inputs to give even more control of level and routing.

8 Channel DAW System

If you have an 8 channel I/O DAW system, then you could connect the AWS 900+ Record Bus Output and Track Busses Outputs 1-6 to the eight inputs of the DAW I/O unit. The 8 DAW outputs can then be fed to any of the console's channel inputs, and to 5.1 External A monitor input three (which is labelled DAW), to allow the DAW output to be monitored through the AWS 900+ monitoring section.

16 Channel DAW System

With a 16 channel I/O DAW system, you could connect the AWS 900+ Record Bus Output and Track Busses 1-8 to the first 10 inputs of the DAW I/O unit. Or you could connect the first 14 Direct Outputs from the console's channel modules 1-14 to the inputs of the DAW I/O unit and connect the AWS 900+ Record Bus Output to inputs 15 and 16.

The 16 DAW outputs can then feed any of the channel inputs, with outputs 1-6 also feeding the 5.1 External A console monitor inputs and 7 and 8 feeding the stereo External B monitor input. These could be used as track outputs from the DAW so you can mix small projects entirely in the analogue domain or to mix stems created in the DAW.

24 Channel DAW System

If you have a 24 channel I/O DAW system, you could connect the AWS 900+ Record Bus Output and Track Busses 1-6 to the first 8 inputs of the DAW I/O unit; console Direct Outputs 1-16 can then feed DAW converters 9-24. Alternatively, all 24 Direct Outputs could feed the 24 converters of your DAW I/O unit for one-to-one tracking from the AWS 900+ channel modules.

The 24 DAW outputs can then be fed to the console's 24 channel inputs, and/or to the 5.1 External A and stereo External B monitor inputs.

32 Channel DAW System

For a 32 channel I/O DAW system, you could connect the AWS 900+ Record Bus Output and Track Busses 1-6 to the first 8 inputs of the DAW I/O unit. All 24 channel module Direct Outputs can then feed DAW inputs 9-32.

The first 24 DAW outputs could feed all of the console's channel line inputs, and outputs 25-30 can be used as a 5.1 output and 31 and 32 as a stereo output to the AWS 900+ external inputs.

Custom Combinations

As you can see, a wide variety of connections are possible between the AWS 900+ and a DAW. It is worth taking some time and thought as to the best way to connect up your system for a flexible workflow that suits your studio's requirements.

DAW I/O Labelling

When using DAW routing with the AWS 900+ console, it is advisable to take some time to sensibly label the inputs, outputs and busses within your DAW. Details on how to do this will be found in the documentation supplied with your DAW. Sensible labelling will make the task of performing routing via the AWS 900+ front panel a simple task, rather than relying on having to decipher long complex names often assigned by default to DAW channels.

For example in a 24 I/O system, simply naming inputs and outputs '1' through '24', and busses 'b1' through 'b24' will allow a simple differentiation between hardware I/O and internal DAW busses when using the console control surface. In some DAW systems, I/O paths can be grouped. In this case label stereo paths in pairs such as '1-2', and sub paths as '1' and '2'.

Example Methods of Operation

The following paragraphs will guide you through example configurations for the main production methods of Recording and Mixing.

In practice, these methods will cross over to a large degree, however we shall work through simple versions of each of them in order to understand the processes involved when using a DAW and analogue console together.

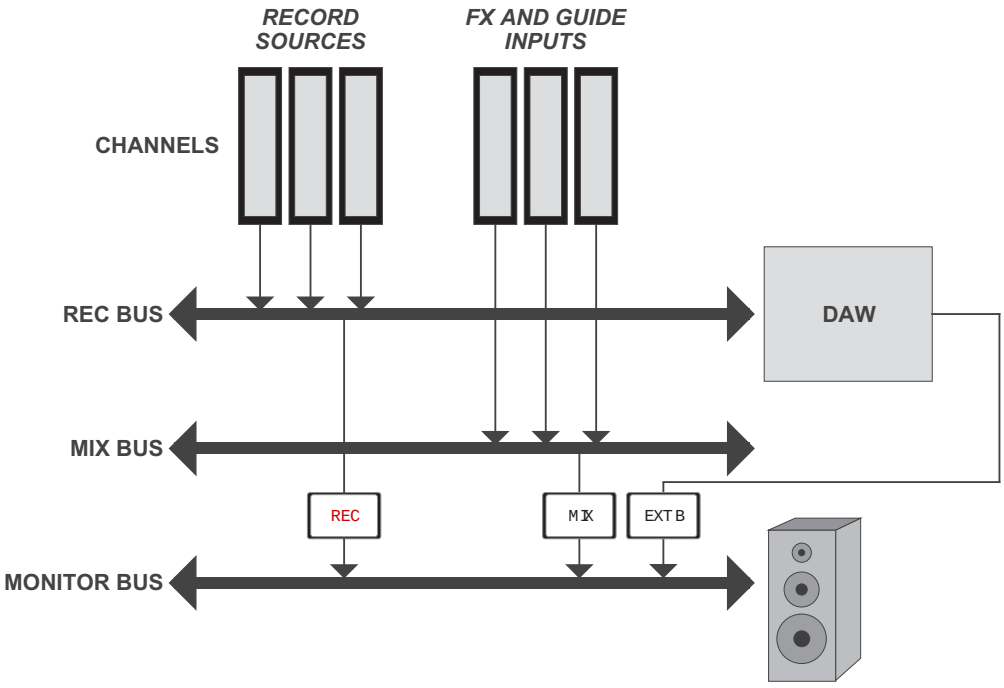
Section 5 includes detailed descriptions of the DAW interface and its operation.

Recording (using External Monitor Returns)

Overview

For the following example we will use the 2 channel I/O DAW configuration described above, where all the console Record Bus Outputs feed DAW inputs 1-2 and DAW outputs 1-2 feed the External B monitor selector, Input 3 (labelled DAW in the Monitor Control Panel).

Any of the 24 channel modules are available for recording signals to the DAW, while a stereo output from the DAW is used to monitor the DAW tracks. The block diagram below shows this in simplified form.



Detail

Record sources can be fed to the channel modules via either the channel microphone inputs, line level inputs or high-impedance instrument inputs. Spare channels can be used to return guide tracks, keyboard outputs and outboard effects devices.

Route all inputs to the console Mix Bus.

Create as many channels as you require within your DAW project, and assign all their inputs to input 1 or 2.

Assign the DAW channel outputs to the stereo output connected to the AWS 900+ External B monitor selector.

Select **SUM, EXT B** and **MIX** monitor source buttons on the Monitor Control Panel. Adjust the monitor level using the main monitor level pot. Switch to DAW focus mode and adjust the DAW monitor mix using the AWS 900+ faders. Switch to Analogue Focus mode and use the faders to set suitable levels on the AWS 900+ inputs.

Recording

To record an input route it to the **Record Bus** and remove it from the **MIX** bus. Select **RDY** on the Master Control Panel and press **SEL** to record arm the track on the DAW that you wish to record on. Pan the input channel if necessary. Provided you have Auto Input selected you should see the input signal on the DAW meters.

The channel equaliser can be used to process the input before recording it, and the assignable dynamics can be routed to either the input channel or the Record bus if dynamics processing is needed.

Creating a Monitor Mix

If you are in Stop you will hear the input to channels in ready via the DAW *and* via the Record bus if you select **REC** on the Monitor Control Panel. In Play you will hear the input signal via the Record Bus and playback from the DAW track. In Record you will hear the input signal via the Record Bus *and* via the DAW track. To remove this double monitoring either turn off **REC** on the monitor source selector or cut the DAW channel to remove it from the DAW mix.

Creating Foldback Mixes

Foldback mixes can be quickly created using the Foldback Mixer section in the AWS 900+ centre section. Select **MIX** and **EXT B** on the Mix 2 section and **REC** on the Mix 1 section, then use the **Mix 1** and **Mix 2** level controls to create a foldback mix. More complex mixes can be created using the **CUE ST A** bus in place of the Record bus.

Another independent mix can be generated using Foldback Mixer B and the **CUE ST B** bus.

Using the FX Returns

Using the four FX send busses, external FX processing such as reverbs and delays, can be used. FX unit outputs can be returned back into the AWS 900+ via the four Stereo Return inputs in the console centre section. These can be routed to either of the foldback mixers, and to the record and mix busses.

Recording To Multiple Tracks

In situations that require more than a pair of tracks to be recorded simultaneously the eight track busses can be used to generate mixes or the channel direct outputs can be used to record single sources.

Recording With a Split Desk

Selecting **CHANNEL** on the Master Control Panel while in DAW Focus will allow you to control the input levels from the channel rotary encoders and the DAW mix from the channel faders. Pushing the Channel Rotary Encoder will swap the encoder and fader, which allows some faders to control input level and others to control the DAW monitor mix, mimicking the operation of a split console.

Recording with a 5.1 Monitor Mix

If you wish to use a 5.1 monitor mix then the process of recording is much as described above, the only differences being that you should simultaneously produce a stereo mix from the DAW for foldback purposes and connect this to External source selector B. The **MON** source on the Foldback mixer section is fed by a 5-2 folddown of the main monitor busses, so this could also be used instead but means you have less control over the mix going to the foldback outputs.

Mixing

There are three main methods of mix down available when using an AWS 900+ and DAW combination – mix down within the DAW, mix down via the AWS 900+ channel modules and a hybrid of the two previous methods.

The decision on which method to use will probably vary from session to session, with factors including time, sonic quality, session size and many others. The AWS 900+ is by no means fixed to a specific way of working either.

Mix down within the DAW

The first method effectively uses the DAW internal mix bus to sum the DAW channels together, producing an output mix which can be returned to the AWS 900+, via either an External Input, or fed to individual channels on the desk for processing. Using channels to return the stereo master output to the desk is desirable if you have many other MIDI keyboard parts, samplers etc. which need to be monitored alongside the DAW return signal.

The channel modules can feed either the Mix or Record bus, both of which can, for complete monitoring flexibility, be summed together, along with other External Source signals.

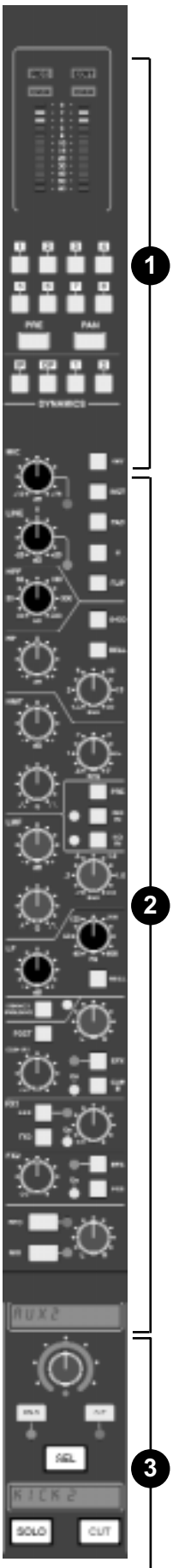
The power of the AWS 900+'s comprehensive DAW control functions can also be used to handle various aspects of mixing and editing for the DAW system. All 24 faders can act as DAW control faders, whilst the 24 channel rotary encoders act as assignable controls for other DAW functions. Details of all the DAW control functions can be found in Section 5 of this manual.

Mixing via AWS 900+ SuperAnalogue Channel Modules

The second approach is to feed individual DAW outputs directly to the AWS 900+ channel modules' line level inputs, on a one-to-one basis. This means that the AWS 900+ can be used as a traditional analogue mixer, allowing analogue EQ and compression to be applied to individual DAW channels. Up to 24 fully-featured inputs can be accommodated in this fashion. The channel outputs can then be summed entirely within the analogue domain, and either recorded back into the DAW or mastered to a high-quality external recorder.

The Hybrid Mixing Approach

Using a combination of the two methods described above, a mix can be generated where some DAW outputs are pre-mixed to stereo, or 5.1 stems, and returned to the AWS 900+ via channel modules or External A monitor inputs. Other DAW channels can be routed individually to AWS 900+ channel modules. The External Source inputs and console Track busses can be summed together via the Monitor Control Panel's External A source selector, and output via the monitor insert send to an external recording device.



Channel Strip

Introduction

The AWS 900+ analogue channel strip has a single signal path. However, users who are familiar with SSL's range of in-line consoles will soon realise that the channel strip faders can control channel signals as well as virtual faders on the workstation, parallelling the large/small fader configuration of an in-line channel strip.

The channel features a switchable Mic/Line input; the channel output can be fed to the Record bus, the Mix bus, or any combination of eight Track busses.

In addition to the Cue Stereo send and four FX Sends, a dedicated Direct Output is provided.

The channel has comprehensive routing for EQ and filter, dynamics, and insert send/return points.

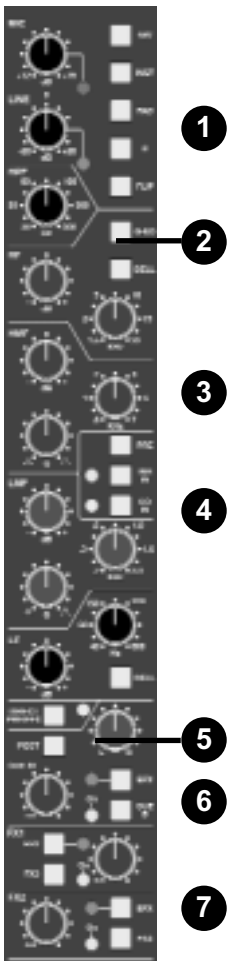
The channel strip is divided into four sections:

1. Starting with the 'meter bridge', an 8-channel wide panel (aka 'tile') holds the Track bus and Dynamics routing buttons as well as the channel meter.
2. Individual channel modules house the input section, EQ, Cue and FX Sends, Record and Mix bus routing, and the Pan pot.
3. The DAW control functions at the foot of the channel are mounted on an 8-channel wide panel.

   Finally, each channel strip is fitted with a long-throw (100mm) moving fader (shown later).

At your first introduction to the AWS 900+ console, you will immediately see that the channel strip controls are presented in a pleasingly familiar manner. The following pages describe each control in detail, with brief coverage of the routing possibilities. See the start of this section for more on signal routing.

Note: In the following descriptions, the connectors referred to are on the rear of each channel module, unless stated otherwise.



1 Channel Input Section

This provides a balanced Line Input (XLR connector) with ±20dB of gain (the pot is indented at unity gain), and a Super Analogue mic amp (XLR connector) with switchable **48V** Phantom Power, 20db **PAD**. The **INST** button selects a 1 MΩ high impedance input (6.35mm jack), suitable for sources such as guitars, for control via the **MIC** pot. **FLIP** toggles the Mic/Instrument (red LED) and Line inputs (green LED). Note that selecting **INST** will automatically force selection of the Mic/Instrument. Phase reverse (**Ø**) for the selected (balanced) input.

2 Filter

18dB/Octave high pass filter (**HPF**). The filter is out of circuit when the control is fully anticlockwise. When the filter is in circuit, the normally red **EQ IN** LED lights green.

3 Equaliser

The **G-EQ** button toggles all bands between the default 'E-Series' parameters to the curves and control interaction of 'G-Series' EQ. The bands basically function as follows: **HF** high frequency shelving equaliser switchable to fixed Q parametric (**BELL**); **HMF** high frequency parametric mid band equaliser; **LMF** low frequency parametric mid band equaliser; **LF** low frequency shelving equaliser switchable to fixed Q parametric (**BELL**). The **EQ IN** button (located next to the insert buttons) routes the channel signal through the EQ and filter section. When in circuit, the **EQ IN** LED lights red. If the filter is also in circuit, this LED changes to green.

4 Insert Point

The **INS IN** button routes the channel signal via the balanced insert 'SEND' and 'RTN' jacks on the rear of the channel module. The insert point defaults to post the equaliser; **PRE** places the insert before the equaliser. In conjunction with the Dynamics **IP** and **OP** routing buttons, the order of the EQ, Insert and Dynamics sections can be configured for a wide variety of processing and routing architectures (see page 4-11 for more on signal processor routing).

5 Direct Output

DIRECT PRE/EFX button sources the channel direct output from a pre fader signal instead of the default post fader signal *unless* an EFX send (see below) is active. If an EFX send is active and **PRE/EFX** is selected this is routed to the direct output instead of to the track busses. The **PRE/EFX** LED lights red to show the direct output is fed by the pre fader signal **or** green if fed by an EFX send.

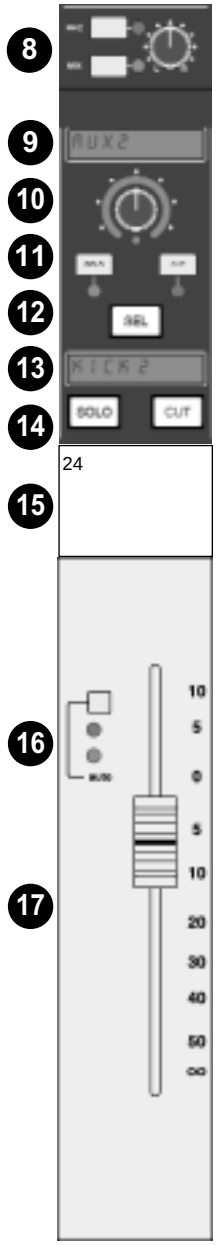
6 Cue Stereo Send

The Cue Stereo send is normally fed a pre fader signal but can be selected to **POST** fader. An alternative Cue Stereo bus may be selected by pressing **CUE B**. The level pot is fitted with a push-push On/Off switch. Master controls for the two Cue Stereo outputs are provided in the centre section. See below for details on the **EFX** button.

7 FX Sends

Four mono FX send busses are provided. The **FX3** and **FX4** buttons enable sends 1 and 2 to access busses 3 and 4. Each level pot is fitted with a push-push On/Off switch. Master controls for these sends are provided in the centre section.

The **EFX** buttons isolate the selected send (including Cue Stereo) from its mix bus and route the signals to either the Track busses, or to the Direct Output if **DIRECT PRE/EFX** is selected, allowing additional independent effects send or headphone mixes to be easily generated. Pressing **EFX** on the stereo send routes Cue Stereo left to odd Track busses and Cue Stereo right to even busses. Mono FX sends are routed to all Track busses. Note that only one of the channel aux send controls may feed the EFX system.



8 Channel Output

The stereo pan pot feeds two independent stereo busses via the **REC**(ord) and **MIX** buttons. Post pan signals may also be fed to the eight Track busses.

9 Upper Scribble Strip

Displays the channel name, the name of a DAW track, selected send, or I/O data according to the function currently assigned on the Master Control Panel (see Section 5).

10 D-Pot Rotary Encoder

This control is used to adjust the currently assigned DAW parameter or the analogue channel level; functions are assigned from the centre section (see Section 5).

11 D-Pot Cut and Solo

CUT and SOLO buttons for the gain function assigned to the rotary encoder. SOLO is only active when a channel fader (DAW or console) is the assigned function.

12 Selected Channel Function

The SEL button operates the DAW 'Selected Channel' function. This function can be assigned from the centre section, to track arm a selected channel or assign the 'plug-in' editor. Tallies in the channel meter display Record Ready and Edit status when the console is in 'DAW Focus Mode' (see Section 5 for more details).

13 Lower Scribble Strip

Displays the name of the track being controlled by the channel fader, or other DAW information, according to selections made on the Master Control Panel (see Section 5).

14 Channel Cut and Solo

CUT and SOLO buttons for the gain function assigned to the channel fader. SOLO is not active if a function other than the channel level (DAW or console) is being controlled.

15 Scribble Strip

Traditional scribble strip – use it for scribbling on.

16 Automation control

Automation mode switch for the currently assigned DAW track; the LEDs indicate automation write and read statuses (see Section 5 for more details).

17 Moving Fader

100mm moving fader controls the analogue channel, or assigned DAW track, or send level. The required function is selected via the Master Control Panel (see Section 5 for details).

18 DAW Status Indicators

REC indicates the Record Ready status of the currently assigned DAW track. **EDIT** shows if the DAW channel associated with that channel strip is currently assigned to the plug-in editor (see Section 5 for more details).

19 Channel Meter

Dual 12-segment peak meters indicate either analogue channel input (post input trim) or the DAW meter level on the left hand bargraph. The bottom segment lights permanently when metering analogue signals to provide a clear indication of which signals are being displayed. The meter source follows the Console Focus selection, so in DAW focus the meters display DAW signals and in Analogue Focus Mode the meters display analogue inputs.

Stereo DAW tracks use both bargraphs.

5.1 channel tracks can be displayed across three meters by pressing **OPTION + SOLO** to select the track.

18 **OVERLOAD** indicators give a clear indication of an overload condition, even if you can't hear it! The overload threshold is +24dBu for analogue signals and 0dBFs for digital signals..

20 Track Bus Routing

For routing channel and EFX signals to one or more of the eight Track busses. The default channel to Track bus source is post fader; **PRE** selects the pre fader channel signal. **PAN** selects the post channel pan output. **PRE** defeats the **PAN** signal if selected. If an EFX send is active, the routing source to the Track busses is the selected Cue/FX level pot output unless the **DIRECT PRE/EFX** button is pressed.

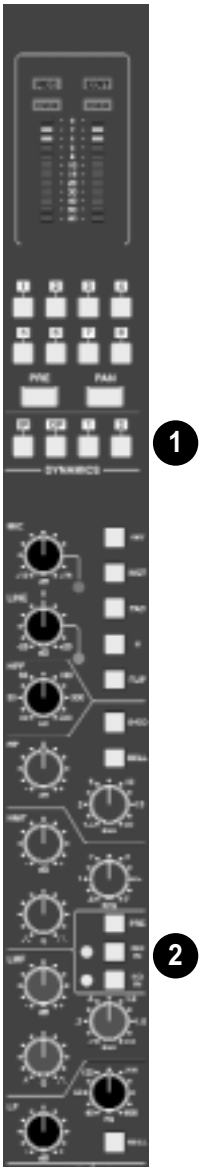
21 Dynamics Assignment

The Dynamics **1** and **2** buttons insert one of the two centre section compressor/gate processors into the channel path. These are non-latching buttons that will only function if that processor is not currently assigned to another channel or stereo bus. The dynamics sections normally receives a post EQ, pre insert signal. The **IP** and **OP** buttons place the dynamics section as the first or last element in the channel processing chain. See page 4-11 for more details.

Signal Processor Routing

In keeping with SSL's legendary range of large-format consoles, the AWS 900+ provides comprehensive signal processor routing facilities. Each channel strip has access to up to three separate signal processing devices:

- 4-band parametric equaliser and high pass filter
- Assignable dynamics section comprising a compressor/limiter and expander/gate
- Any device connected the channel insert point



Three buttons – IP, OP, 1 and PRE 2 are used to determine where each processor will be placed in the signal chain. Three additional buttons are provided to switch each device into circuit:

EQ IN, INS(ert) IN 2, and dynamics IN 3

Two further buttons – Dynamics **1** and **2** 1 are used to select on one or other of the assignable dynamics sections.

The table below shows the routing possibilities along with some applications for the insert send/return where it is not needed for use with an external processor (note that selected buttons are shown with white text on a black background).

DYNAMICS		INSERT	PROCESS ORDER	ADDITIONAL 'NON INSERT' APPLICATIONS
IP	OP	PRE	**EQ > DYN > INS**	Pre fader send to recorder; external mic pre direct to channel fader
IP	OP	**PRE**	**INS > EQ > DYN**	Channel mic pre to recorder; external mic pre to channel processing
IP	OP	PRE	**DYN > EQ > INS**	Pre fader send to recorder; external mic pre direct to channel fader
IP	OP	**PRE**	**DYN > INS > EQ**	
IP	**OP**	PRE	**EQ > INS > DYN**	
IP	**OP**	**PRE**	**INS > EQ > DYN**	Channel mic pre to recorder; external mic pre to channel processing

Note that the dynamics processors may be keyed from an external signal.
See page 4-18 for further details.

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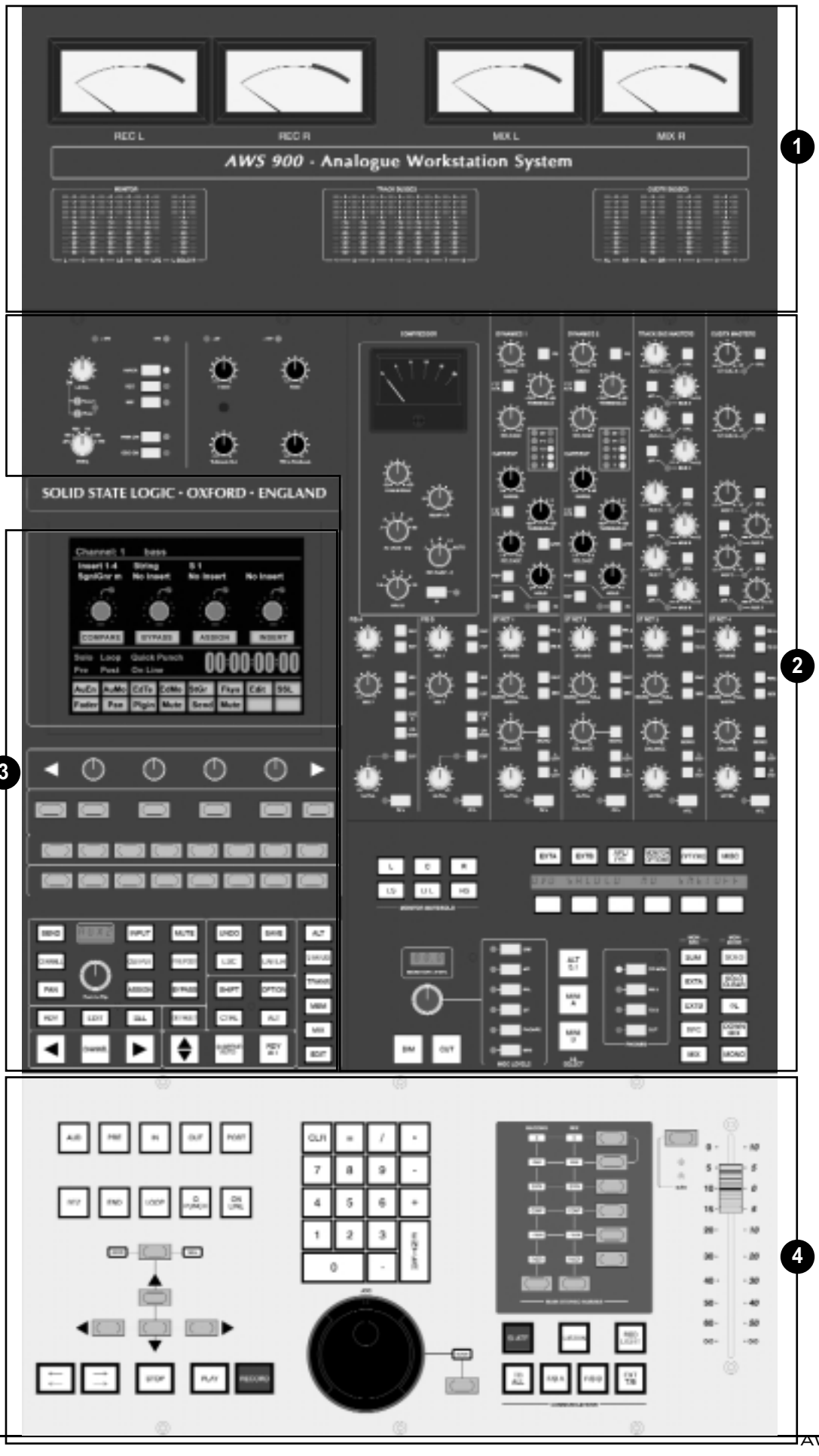

REC L
REC R
MIX L
MIX R
AWS 900 - Analogue Workstation System
SOLID STATE LOGIC - OXFORD - ENGLAND
1
2
3
4

Centre Section

Introduction

The console's centre section (see opposite) – although not strictly in the centre of the console – comprises four main areas:

1. Centre section meter panel.
2. Analogue master control functions.
3. TFT screen and associated control panel dedicated to DAW control.
4. In the fader area, a dual purpose panel provides further DAW-associated functions and motion controls, while on the right of this panel are located controls for the main bus outputs, including an assignable master fader, plus a set of talkback buttons.

The following pages cover all the analogue controls in the centre section. See Section 5 for details of the console's DAW control facilities.

Power Supply Indicators

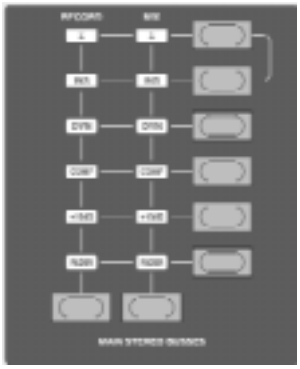
Starting in the top left of the main area of the centre section, you will find a row of four LEDs that display the current state of power rails within the console. The ±15 Volt and the +4 Volt supplies are for analogue audio and logic circuitry respectively. The +12 Volt supply provides power for the faders and some relays. All LEDs should normally be illuminated, if not – try not to panic!

The rest of the analogue facilities in the centre section will be discussed in a logical 'audio' order, starting with the console's main outputs.

Main Output Functions

Both the console's stereo Record and Mix busses are provided with identical controls. To see these in diagrammatic form, refer to the foldout diagram at the end of this manual.

A 'mini-matrix' of main bus select functions (see left), on the motion control panel, is used to assign facilities to either of the busses:



1

2

1. Press and hold the required **RECORD** or **MIX** bus button.
2. Select the required facility; the associated 'flag' will light to confirm your selection.

To all intents and purposes, the bus signal flows through these facilities from top to bottom.

The Record and Mix busses have balanced pre fade insert points. Switching on **INS** switches the insert point into circuit, with the insert return replacing the bus signal. If $\sum$ is selected then the insert return is summed with the bus signal. This opens up a number of creative options - for example you can sum the output of another submixer or of your DAW with the console mix busses without using channels or you can process some signals via the Record bus, then sum the Record bus outputs with the Mix bus for further processing.

This insert point for each bus is pre main fader and compressor (see below).The insert send and returns are connected via 6.35mm jacks on the centre section connector panel (Send/Return, Left/Right).

Dynamics (DYN)

The centre section dynamics may be inserted into the Record or Mix bus (not both) using the **DYN** button in the main bus select matrix (see previous page). If the indicator does not light check that neither of the dynamics units is assigned to a channel.

The dynamics sections are inserted after the insert point; Dynamics 1 handles the left bus, Dynamics 2 the right bus; select the **LINK** function for stereo tracking.

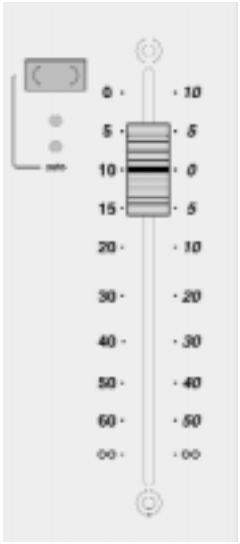
Stereo Compressor

The AWS 900+ features a new version of SSL's legendary G Series (aka Quad) compressor. The compressor can be assigned to either the Record or Mix bus (not both) using the **COMP** button in the main bus select matrix (see previous page).

Selecting the **IN** button to switch the compressor into circuit introduces no additional audio circuitry to the main outputs.

This is a high quality stereo compressor with straightforward controls. The gain **MAKE-UP** simply acts as a level control to compensate for the lowered level that is a consequence of compressing the signal. This control may be set so as not to change the overall output level when the compressor is switched in. The meter indicates dBs of gain reduction.

Master Fader



The master fader can be selected to control the stereo Record bus or the Mix bus by selection of the appropriate **FADER** function on the main bus select matrix. The fader can control the level of both Record and Mix busses simultaneously but can only set the level for one bus at a time. The fader uses a 36-bit, Hi-Resolution MDAC.

If required, a further 10db of gain may be introduced by selecting the **+10dB** function on the main bus select matrix. When selected, use the right hand scale on the master fader.

The automation status button and LEDs fitted next to the fader are not used at this time.

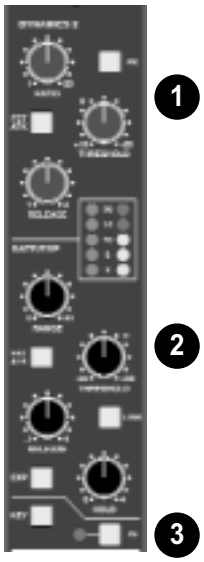
Following the injection of talkback and tone, the main output busses feed XLRs on the centre section connector panel.

Metering

The Record and Mix bus are each provided with a dedicated pair of VU meters above the centre section.

Centre Section Dynamics

Two assignable dynamics sections are provided. Each section comprises a compressor/limiter and a gate/expander, both of which use the same gain element. The dynamics may be assigned singly or as a pair to any channel using the Dynamics **1** and **2** buttons on the channel meter panel. Alternatively, they may be assigned to the Record or Mix busses by means of the **DYN** function on the main bus select panel. In this case, Dynamics 1 is used for the left bus, Dynamics 2 for the right bus. The **IN** button 3 switches the entire section in and out of circuit



1 Compressor/Limiter Section

RATIO – When turned to 1:1, the compressor/limiter section is inactive. Turning the control clockwise increases the compression ratio, giving a true limiter at the fully clockwise position. The compressor normally has an 'over-easy' characteristic. Pressing the **PK** button switches this to peak sensing, and replaces the 'over-easy' characteristic with a hard knee.

THRESHOLD – Whenever a signal exceeds the level set by this control, the compressor will start to act at the ratio set by the **RATIO** control. The **THRESHOLD** and **RATIO** controls also provides automatic make-up gain, so as you lower the threshold and introduce more compression, the output level is increased, maintaining a steady output level regardless of the amount of compression.

FST ATK – Normally the attack time is program dependent (3mS - 30mS). Press this button to select a fixed fast attack time (3mS for 20dB gain reduction).

RELEASE – Sets the time constant (speed) with which the compressor returns to normal gain settings once the signal has passed its maximum.

2 Gate/Expander Section

This section can act as a ∞:1 Gate or as a 2:1 Expander when the **EXP** button is pressed.

RANGE – Determines the depth of gating or expansion. When turned fully anticlockwise (Range = 0), this section is inactive. When turned fully clockwise, a gate depth of 40dB can be obtained.

THRESHOLD – Determines the level at which the gate opens or below which gain reduction begins (**EXP** selected). Adjustable from +10dBu to -20dBu. Variable hysteresis is incorporated in the threshold circuitry to prevent spurious triggering of the gate when the signal is close to the threshold level. This means that the signal has to decay roughly 2dB below the threshold level before the gate will start to close.

FST ATK – Normally, a controlled linear attack time of 1.5ms per 40dB is provided. Press this button to select a fast attack time (100µs per 40dB). The attack time is the time taken for the Gate/Expander to 'recover' once the signal level is above the threshold. When gating signals with a steep rising edge, such as drums, a slow attack may effectively mask the initial THWACK, so you should be aware of this when selecting the appropriate attack time.

RELEASE – This determines the time constant (speed), variable from 0.1 to 4 seconds, at which the Gate/Expander reduces the signal level once it has passed below the threshold. Note that this control interacts with the Range control.

HOLD – Determines the time after the signal has decayed below the threshold before the gate starts to close. Variable from 0 to 4 seconds.

Metering

4 The yellow and red LEDs indicate the amount of gain reduction the compressor section is applying.The green LEDs indicate the amount of gain reduction applied by the Gate/Expander section.

5 The **LINK** button links the sidechain signal of that unit to the sidechain of the other dynamics section. When the two sections are linked, the control voltages of each section sum together, so that whichever section has the most gain reduction will control the other section. Don't try to link two gates using the **LINK** button when you want the signal on one to open the other - as soon as one gate closes both will close, which probably is not what you wanted. If you need to achieve this effect, take a keying signal from one channel to trigger the other. The easiest way to do this is by patching from the insert send of the 'source' channel into the key input of the appropriate dynamics section (see below).

6 The **KEY** button enables a dynamics section to be controlled by an external source signal. Connect the source via the appropriate key input jack on the centre section connector panel.

Track Bus Master Controls

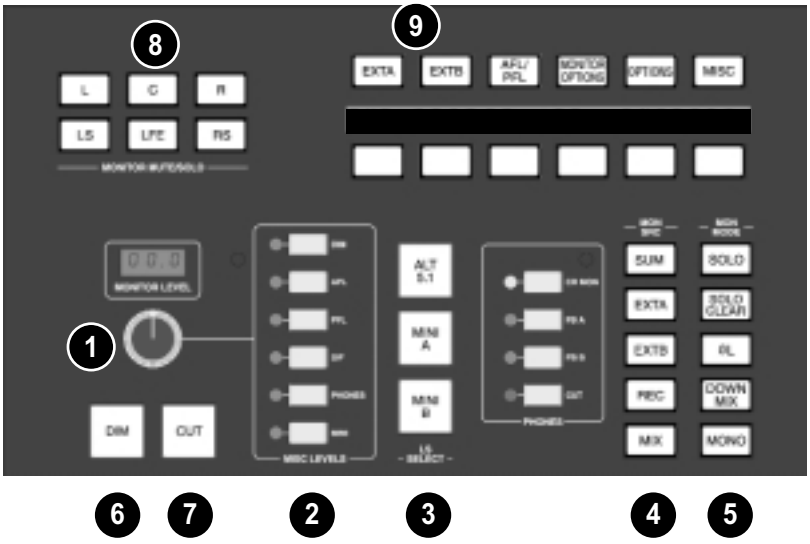
The master output level controls for the eight track busses busses (in the top right of the centre section – see left) all have 10dB of gain when turned fully clockwise. The controls are indented at the '12 o'clock' position, which corresponds to 0dB gain.

Following level control, the bus outputs can be injected with tone (oscillator **TRACK** switch) and talkback (talkback **SLATE** switch) before being fed to a 25-way D-type on the centre section connector panel.

An **AFL** function (post tone and talkback inject) is provided for each bus.The AFL signal is intelligently assigned to left and right AFL busses. Selecting AFL on a single Track output will route signal to both left and right AFL busses. Selecting AFL on odd and even numbered Track outputs will route the odd numbered output to the left AFL bus and the even numbered output to the right AFL bus.

A set of LCD bargraph meters in the centre section are dedicated to metering the bus outputs.

Monitoring



1 The large knob below the 'MONITOR LEVEL' display normally sets the level of the main control room monitors.

2 The column of six buttons to the right enables this control to be used for the named functions.

3 You will be monitoring on whichever set of speakers is selected from the 'LS SELECT' group: the Main 5.1 speakers ('Main A' – the default with no buttons selected), **ALT 5.1** ('Main B'), **MINI A** or **MINI B**.

4 The loudspeakers are fed from whatever source has been selected in the 'MON SRC' group of buttons. These include the Record bus (**REC**), the Mix bus (**MIX**), and two external source selectors, **EXT A** and **EXT B**. Sources will be intercancelling unless the **SUM** button is selected. All sources to the monitoring are stereo except those brought in via the **EXT A** monitor source selector (see below).

5 The console has three monitor modes: **5.1**, **DOWNMIX** and **MONO**, selected via the 'MON MODE' group of buttons. **5.1** mode is the default (**DOWNMIX** and **MONO** *not* selected) and connects all six monitor busses to their respective monitor outputs. Selecting **DOWNMIX** folds down the 5.1 inputs to the monitor path via a 5-2 matrix, and feeds the result to left and right monitor outputs. The centre channel is reduced in level by 3dB.and fed to both left and right in this mode. **MONO** can be selected with or without **DOWNMIX** and sums the left and right monitor busses, feeding the result equally to the left and right monitor outputs. The **ØL** button follows the **MONO** switch and reverses the phase of the left monitor feed, providing a quick way of checking for any phase anomalies in a stereo mix. The **SOLO** button turns the monitor cut buttons (see next page) into monitor solo buttons. The **SOLO CLEAR** button lights when a channel **SOLO** button or any centre section **AFL** button is pressed. Press this button to cancel any Solo/AFL/PFL function.

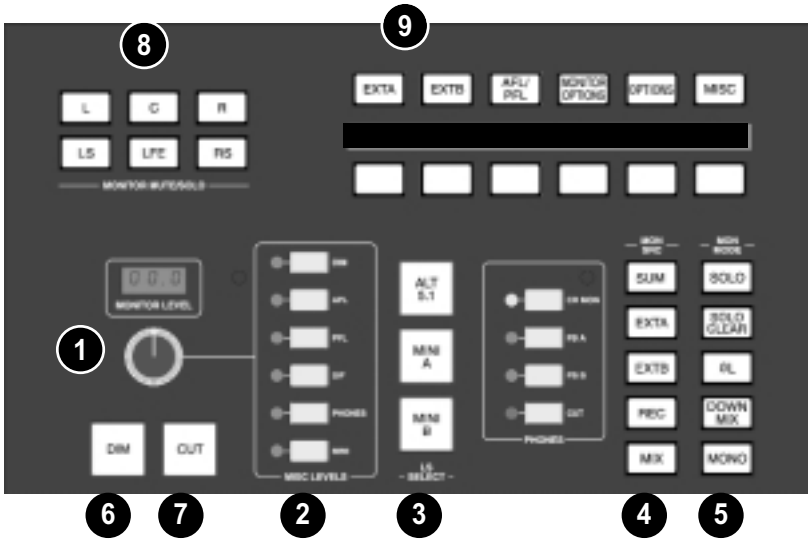
If either **MINI A** or **MINI B** are selected, the left and right monitor busses are fed to the corresponding stereo mini loudspeaker output. Control the level using the main monitor pot by selecting **MINI** in the 'MISC LEVEL' group 2. When a Mini speaker output is selected, the 5-2 **DOWNMIX** is automatically switched into the monitor circuit to deal with any 5.1 sources present.

6 The **DIM** button dims both main and mini loudspeaker outputs by a preset level. Set this level by selecting **DIM** in the 'MISC LEVELS' group and using the main monitor pot. The **DIM** button is automatically activated when any of the following buttons are pressed: **LISTEN**, **TB ALL**, **F/B A**, **F/B B**, **EXT T/B**, Oscillator to **TRACK**, **REC** or **MIX**.

7 The **CUT** button cuts the monitor feeds to whichever set of monitors is selected. **CUT** is activated automatically by the **SLATE** talkback button.

CUT and **DIM** can also be activated externally via the GPIO/Talkback connector.

Monitoring (Continued)



The six main monitor outputs can be muted individually with the **L**, **C**, **R**, **LS**, **RS** and **LFE** (sub) monitor cut buttons 8. Note that these can become monitor solo buttons by selecting the **SOLO** button in the 'MON MODE' group 5.

All the monitor outputs are available for connection to amplifiers via the centre section connector panel. The two 5.1 outputs (Main and Alt) and the two Mini outputs feed two 25-way D-type connectors – 'MON A' and 'MON B'; the two Mini outputs (Mini A and Mini B) also feed individual XLRs for left and right.

External Source Selectors

Two external monitor source selectors are provided. **EXT A** has four external 5.1 inputs. These may be fed by any source of six channels or less. Track busses 1-6 provide a fifth input to **EXT A**.

EXT B is a 2-channel selector with four stereo inputs. In either case, sources may be summed together; this is particularly useful for generating complex foldback mixes or when stem mixing, as it allows the recorded stems to be monitored together with the current mix.

To select an external monitor source, first press either the **EXT A** or **EXT B** button 9, choose a source from those shown in the display, and press the soft key under that source (or first press the key under **SUM** to sum selected sources). Finally, route the external source(s) to the monitors by pressing **EXT A** or **EXT B** in the 'MON SRC' group. 4 The **LTR** selection on EXT B provides monitoring for an encoder's LtRt output - see below.

Inputs to the external source selectors are connected via 25-way D-types (four for External A, one for External B) on the connector panel.

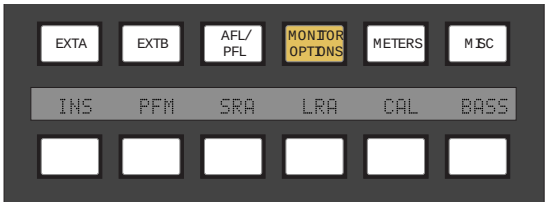
Monitor Insert

The External A selector (ie all 5.1 sources) output is automatically routed via a 5.1 insert point to which an encoder/decoder system may be interfaced; this insert may be switched in/out of circuit using the Monitor Options **INS** key (see page 4-21). The insert send and return appear on two 25-way D-type connectors on the connector panel. The insert point also has connections for the two channel output from the encoder and the input to the decoder. These allow monitoring of the encoder output ('LtRt') signals and provide automatic routing of the External B selector outputs to the decoder inputs for playing back encoded recordings through the decoder. The logic for this is as follows:

- With no sources selected on External B the encoder outputs are linked to the decoder inputs.
- Selecting any source on External B will route the External B outputs to the decoder inputs.
- Selecting **EXT A** and **INS** will monitor the insert return; if no source is selected on External B you will hear the External A signals through the encoder and decoder. If a source is selected then you will hear the decoded output of External B.
- Selecting **EXT B** and **INS** and selecting a source on External B will monitor External B.
- Selecting **EXT B** and **INS** with no source selected on External B will monitor the LtRt encoder outputs. The **LTR** soft key lights to show this. Note that **LTR** is selected by turning off all other External B sources.

Monitor Options

A wide range of monitor options are available via the soft keys and associated display in the Monitor Control Section. Pressing the **MONITOR OPTIONS** button above the display produces the following choices; press the button below an entry to select that option.



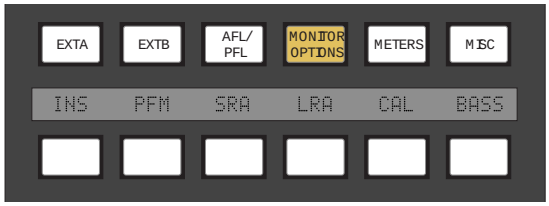
INS – This switches the encoder/decoder insert into the monitor path for use with 5.1 monitor sources selected via the EXT B monitor selector.

PFM – This routes the PFL signal to the Mini A loudspeakers. In this mode the PFL level is controlled by the PFL level control only - the Monitor and Mini level controls have no effect.

SRA – Both sets of Main speaker outputs are capable of handling six channels. If you are mixing in 5.1 and and the client turns up with an alternative set of 'front' (LCR) speakers only, the surround feeds may be locked to the Main A outputs by selecting the **SRA** (Surround on A) function.This allows you to switch to the alternative LCR speakers, connected to the Main B output, and still maintain full surround monitoring. A further option (**ALFE** – see page 4-21) enables the subwoofer output to be included in this arrangement.

LRA – Similar to the **SRA** function except that the LCR monitor feeds are locked to the Main A outputs but an alternative set of surround speakers may be selected by switching to the Main B output. This can be useful in rooms that work on both music, using full bandwidth separate surround speakers, and film using multiple lower powered surround speakers.

Bass Management



Selecting **BASS** produces a further layer of bass management options (see next page for options held under **CAL**).

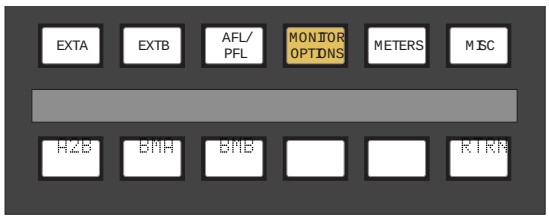
80H – Inserts a 7th order, 80Hz, low pass filter into the LFE monitor bus, to deal with listening to 5.1 material that has a full range, unfiltered, LFE channel.

BMN – Turns on the Bass Management system. This is designed to extend the low frequency response of the monitoring system, and to simulate the 5.1 monitoring systems in TV and domestic environments. It inserts 12dB per octave, 80Hz high pass filters in the L, C, R, LS, RS monitor outputs, and feeds a mono sum of these five outputs to an 80Hz, 24dB per octave, low pass filter, which is summed with the LFE monitor bus. Post this summing point, the combined signals feed via a 10Hz subsonic high pass filter before reaching the subwoofer monitor output. These are the default filter slopes. Internal links (see Appendix page A-17 for details) allow them to be set to 12dB or 24dB per octave and to select whether or not the surround channels are included.

Note that this option is stored separately for each set of speaker outputs (like the level calibration), so it is possible to have Bass Management enabled on one set of speakers and not on others.

LF0 – Normally, the LFE bus level is increased by 10dB post the main monitor level control, as this is a requirement for DVD playback. If you are mixing for SACD, or any other format that requires unity gain on the LFE channel, select **LF0** to restore the LFE bus level to unity gain.

NEXT – selecting this produces a second layer of options:



A2B – Retains use of the Main 5.1 subwoofer, even when you switch to the **ALT 5.1** loudspeaker selection.

BMA – Uses the Alt 5.1 subwoofer instead of the main subwoofer for bass management when **MINI A** is selected and **BMN** is on.

BMB – Uses the Alt 5.1 subwoofer instead of the main subwoofer for bass management when **MINI B** is selected and **BMN** is on.

RTRN – Returns you to the top layer of the **MONITOR OPTIONS** selection.

Monitor Level Calibration

The monitor calibration system enables the level of any loudspeaker connected to the AWS 900+ to be trimmed by ±10db. Note that with the monitor gain at maximum a trim level of +10dB corresponds to unity gain through the monitor section.

Do not attempt to carry out loudspeaker calibration unless you have accurately calibrated test equipment.

Selecting **CAL** in the first layer of **MONITOR OPTIONS** produces the following options:

Turn on the console oscillator (**OSC ON**) and select the **PINK ON** button; the default level for the console's pink noise output is +4dBu RMS. Adjust using the **Pink** trim pot in the oscillator section if necessary.

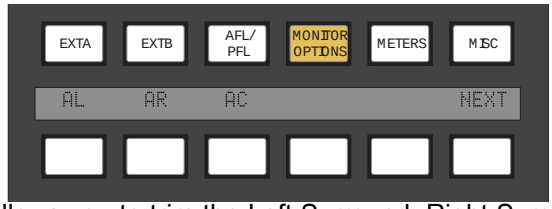
Set the monitor level control to the position you wish to correspond to the calibrated level. A level of 8.5 will provide 10dB of additional gain in hand.

Now select the required monitor system – Main 5.1, Alt 5.1, Mini A or Mini B.

Select the **CAL** menu. Pressing either **AL** or **AR** or **AC** will send pink noise to the Left or Right or Centre loudspeakers respectively Adjust the level for the required SPL (eg. 85dBa C weighting, slow response, on a suitably calibrated dB meter), by turning the main monitor pot left or right from its initial position.

Now work through the rest of the speakers (see below), checking before you calibrate the LFE output whether the **0dB** option (see page 4-22) is off or on.

NEXT – selecting this in the first layer produces a second layer of calibration options:



Selecting **ALS** or **ARS** or **ALF** allows you to trim the Left Surround, Right Surround or LFE channels respectively by ±10db, using the method described above.

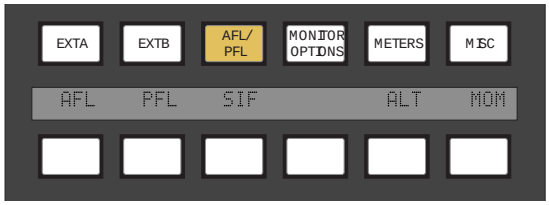
LFG – This stands for Low Frequency Gain. This trim allows the gain of the contribution from the full bandwidth channels to the subwoofer output to be adjusted. Like all the speaker calibration settings it must be set for each set of speaker outputs (assuming bass management is in use).

Having lined up the six main speakers, select **LFG**. In **LFG** mode all speakers are initially muted, and the six monitor cut buttons will light; un-cut the left output and with the bass management turned on (note that the **BMN** selection in the **BASS** menu is duplicated in the **CAL** menu) adjust the **LFG** gain for a flat low end response. Cut the left output, un-cut the right output and check this has a flat low end response. Repeat for all channels. Depending on how well matched the monitors are you may have to adjust the **LFG** gain slightly.

Note that when **LFG** is on the LFE monitor output is always cut. This does not mute the actual subwoofer output, only the LFE signals feeding it. This ensures that you are only measuring the contribution from the bass management system.

SOLO / AFL / PFL

The console's default Solo mode is a destructive solo-in-place – soloing a channel cuts all other channels. The alternative solo modes – AFL, PFL and Solo-in-front are selected via the soft key display in the Monitor Control Section. Press the **AFL/PFL** button above the display to produce the following options:



AFL – Pressing a channel solo button routes the post pan signal, via the stereo AFL bus and the AFL level control, to the currently selected monitor speakers.

PFL – Pressing a channel solo button routes a mono pre-fade signal, via the PFL bus and the PFL level control, to the left and right Main monitor speakers. Optionally, PFL signals may be fed to the Mini loudspeakers – see **PFM** on page 4-21.

SIF – (Solo In Front) Pressing a channel solo button routes a mix of the AFL signal and the selected left and right monitor sources to the monitor outputs. The SIF level control (see page 4-20) adjusts the balance between AFL signal and desk output.

ALT – Makes channel solo buttons intercancel with each other, so that soloing one channel will clear any other solo selections.

MOM – This option makes all the channel solo buttons momentary.

Cue/FX Send Master Controls

Each channel is fitted with one Cue Stereo and four mono FX sends for use as foldback, feeds to effects devices, etc. The Cue Stereo outputs from each channel may be routed to one of two busses – Cue Stereo A or Cue Stereo B and the FX1 and FX2 outputs to the FX3 and FX4 busses respectively.

The master output level controls for these busses (in the top right of the centre section – see left) all have 10dB of gain when turned fully clockwise. The controls are indented at the '12 o'clock' position, which corresponds to 0dB gain.

An **AFL** button is provided for each output. The AFL signal is intelligently assigned to left and right AFL busses. Selecting AFL on a single FX output will route signal to both left and right AFL busses. Selecting AFL on odd and even numbered FX outputs will route the odd numbered output to the left AFL bus and the even numbered output to the right AFL bus.

The two Cue Stereo and four mono FX outputs are available to external devices via a 25-way D-type connector on the centre section connector panel. The mono FX sends are also available on 6.35mm jacks on the connector panel.

A dedicated set of LCD bargraphs just above the master controls provides metering of the Cue and FX busses.

Foldback and Headphone Outputs

The console provides three stereo outputs – Foldback A and B, intended for use in the studio for headphones or LS playback, plus a stereo headphone feed for control room use; sockets for this are provided on the knee panel beneath the centre section. The foldback outputs feed jacks on the centre section connector panel, from where they may be connected to amplifier inputs.

The master controls for Foldback A and B are provided by two identical sections (see left – one section only shown).

1 Each output has a dedicated **LEVEL** control, **CUT**, **AFL**, and six source selector buttons with associated level controls:

The **MIX 1** pot 2 controls the contribution of the Record bus (**REC**) and/or the output of the EXT B (**EXT**) source selector, to the foldback mix.

The **MIX 2** pot 3 controls the contribution of the Mix bus (**MIX**) and/or the output of the EXT B (**EXT**) source selector, to the foldback mix.

In addition, Cue Stereo A (**ST A**) and the stereo downmix control room monitor signal (**ST MON**) 4 may be selected as sources. Foldback B uses Cue Stereo B as its cue source.

Dedicated **F/B A** and **F/B B** talkback buttons are used to add talkback to the foldback outputs.

A small area of the monitor control panel (see left) provides source selection (control room monitor and foldbacks) and a **CUT** function for the console's stereo headphone output. Two headphone sockets are provided below the motion control panel.

The level of this output is set using the **PHONES** button in the 'MISC LEVELS' section of the monitor panel, in conjunction with the main monitor pot.

Stereo FX Returns

The console's four stereo FX Returns are designed to be driven by the outputs of devices which have been fed from the corresponding mono FX busses. Inputs to the returns are interfaced to the console via 6.35mm jacks on the centre section connector panel.

Four identical sets of controls are provided. The controls for FX Return 1 are shown on the left.

1. **R CUT** and **L CUT** cut the associated input – useful for checking reverb returns, and to defeat unwanted signals on the 'open' input when using mono returns.

2. The **STUDIO** level control and its two associated routing buttons (**FB A** and **FB B**) allow FX Return signals (post input cut, pre return level control) to be mixed with the two Foldback outputs.

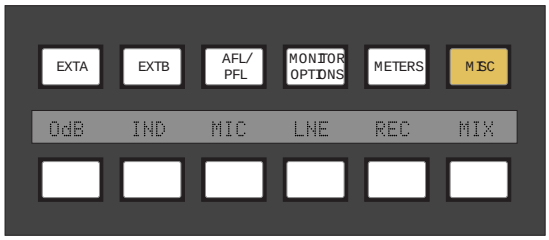
3. **MONO** – when this button is up, the **BALANCE** control will provide a balance between the left and right return signals. With **MONO** selected, the return inputs are summed, and the **BALANCE** control now acts as a pan control. This is very useful when you are using a mono FX device, as it saves having to parallel return inputs. **WIDTH** adjusts the stereo width of a return from full stereo to mono.

4. **REC** and **MIX** enable the output of the return to be routed to the main mix busses. Return signals will be distributed across the busses according to the balance/pan, and width settings.

5. **AFL** – Feeds return signals (pre balance and width controls) to the stereo AFL bus. The rotary **LEVEL** control set the return level (pre balance and width controls) to the main mix busses.

Misc Options

A number of useful options can be accessed via the MISC menu. Press the **MISC** button above the display to produce the following options:



0dB – Sets all faders to 0dB.

IND – When selected pressing any fader **Auto** switch will set that fader to 0dB.

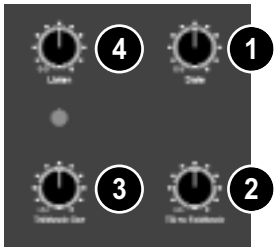
MIC – Sets all channels to mic input.

LNE – Sets all channels to line input.

REC – Routes all channels to the Record bus. A second press un-routes all channels from the Record bus.

MIX – Routes all channels to the Mix bus. A second press un-routes all channels from the Mix bus.

COMMUNICATIONS



A group of communications buttons (talkback etc.) are fitted on the motion control panel (see below). A built-in talkback microphone and controls to set the level of **TB to Foldback**, **Talkback Out** (an external talkback feed), **Slate** level (talkback to Mix, Record and Track bus outputs) and an incoming **Listen** mic, are provided in the utilities section, above the TFT screen (see left).

Note that a gain control for the talkback mic preamp is provided on the connector panel adjacent to the external talkback output jack. If required, an external talkback mic may be connected to the console's talkback distribution circuitry via an XLR on the connector panel. When using this facility, turn the console mic preamp gain fully anticlockwise (off) if you no longer wish the inboard mic to contribute to the talkback system.

Note also that, apart from the **Slate** function which cuts the monitors, all the following functions dim the monitors.

1. **Slate** *interrupts* the Record, Mix and Track bus outputs with talkback.
2. **TB to Foldback** is *added* to the foldback outputs after the level and cut controls. Individual talkback buttons are provided for each foldback output (**F/B A** and **F/B B** – see below).
3. **Talkback Out** controls the level of talkback to an external feed, available via a 6.35mm jack on the connector panel. This signal may be activated by the **EXT T/B** button (see below).
4. **Listen** controls the level of an external mic signal connected via an XLR on the centre section connector panel. The mic is usually placed in the recording area and selection of the **LISTEN** talkback button (see below) injects the mic signal onto the Mini A loudspeaker feeds, and dims the main loudspeakers. The circuitry features SSL's legendary listen mic compressor, the sound of which is much loved by many experienced SSL users, and so the connector panel provides a post compressor output jack – 'Listen Mic Out'.

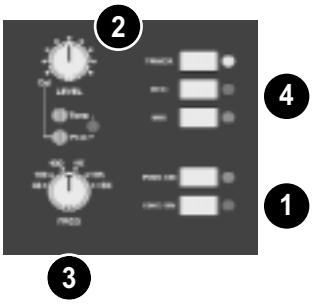
The 'COMMUNICATIONS' buttons (to the left of the master fader) control the switching and routing of the talkback and listen mic signals discussed above, as well as the switching of a red light.

5. **RED LIGHT** – this provides an isolated contact closure for hooking up to a studio red light via an external relay box. This function can be fired from a GPI input (see Section 3 for details).
6. **TB ALL** feeds the talkback mic to the foldback sends and the external talkback output.

Note: The talkback switch functions are all duplicated on the Talkback/GPIO connector on the rear of the console as are the monitor CUT and DIM switches. See Section 3 for more information.

Oscillator

The word oscillator is a slight misnomer in this case, as the console actually provides a comprehensive tone and pink noise generator!



The 'Oscillator' section (see left), located above the TFT screen, contains controls for frequency, level and routing of tone or pink noise to the Mix, Record and Track bus outputs and to the monitor outputs for use in monitor calibration (see page 4-22).

1 **OSC ON** activates the oscillator output (surprise, surprise!). It's good practice to turn the oscillator off when recording, to prevent any accidental routing to desk outputs.

PINK ON switches the output from tone to pink noise. Note that the pink noise level can only be adjusted using the **Pink** 'Cal' preset.

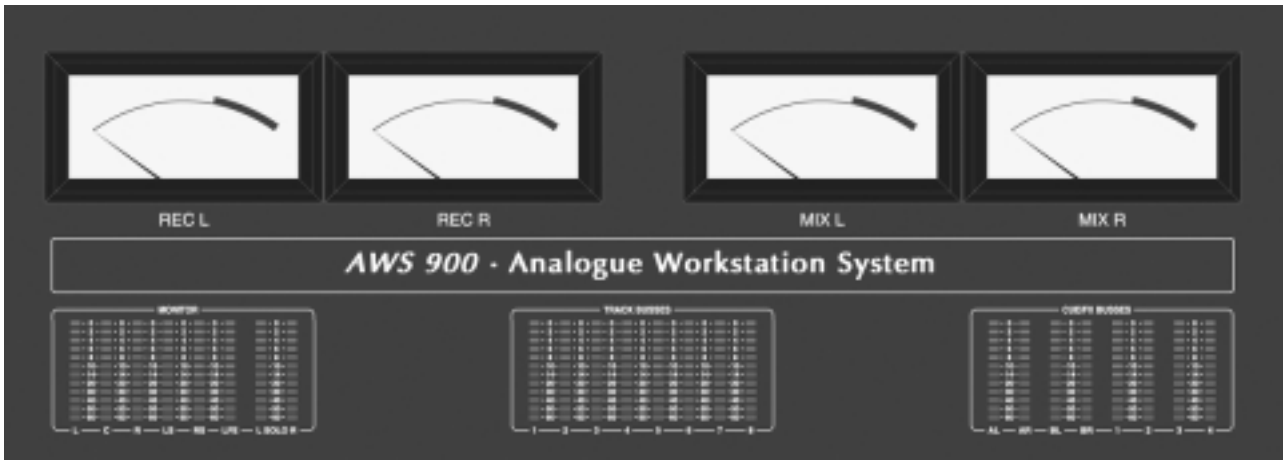
2 The **LEVEL** control adjusts the level of the tone generator from -25dBu to +20dBu. When fully anticlockwise, a preset 'Cal' level is selected which can be calibrated using the multiturn presets located below the level control; a red LED lights to show when the level control is in the calibrated position.

3 When **OSC ON** is selected, the rotary **FREQ** switch provides six preset frequencies.

4 The oscillator may be routed to the **TRACK** busses, the **MIX** bus and the **REC**ord bus (individually or simultaneously).

The oscillator output is also available on an XLR on the centre section connector panel.

Centre Section Metering

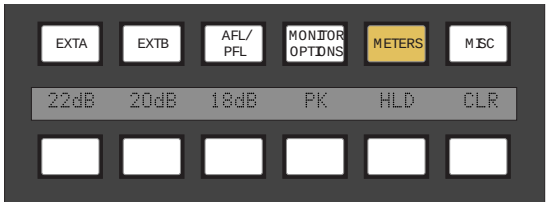


Fitted above the centre section are four VU meters dedicated to reading left and right outputs of the Record and Mix busses.

Beneath these are three sets of eight LCD bargraphs. These are dedicated to the metering of (from left to right): the L, C, R, LS, RS, LFE monitor busses, plus stereo metering of the Solo/AFL/PFL bus (**MONITOR**); the eight Track bus outputs (**TRACK BUSSES**); Stereo Cue A and B plus the four FX bus outputs (**CUE/FX BUSSES**). The standard scale is +24dB for 0dBFS (top of the scale); see below for alternative scale options.

The monitor and solo meter feeds are also available via a 25-way D-type connector on the centre section connector panel, for use with external metering/monitoring.

Meter options are provided by soft key selections on the monitor panel; select the **METERS** button to produce the following selections:



22dB – Selects a +22dB scale for all meters. The default scale is +24dBu for 0dBFS.

20dB – Selects a +20dB scale.

18dB – Selects a +18dB scale.

PK – Switches the meters to peak reading mode; peak readings are held for 3 seconds.

HLD – Select this to hold the peak readings indefinitely.

CLR – Press this to clear the currently held peak readings.

DAW Control

Most of the left hand side of the centre section is taken up with the TFT screen and control panel dedicated to use with your workstation. See Section 5 of this manual for full details.

Section 5 – DAW Control Guide

Introduction

When connected to a Digital Audio Workstation which supports the HUI control protocol, the AWS 900+ becomes a powerful digital work surface controller, giving direct access to the most important controls within the DAW. The console faders can be used to control the workstation faders and sends, the 24 channel D-Pots can be used to control pans, sends and I/O functions and the Master Control Panel and plug-in controller provide easy access to a range of other parameters.

For an up to date list of compatible DAW applications please go to: http://www.solid-state-logic.com. This section is largely based on Digidesign's Pro Tools package. The functionality of other packages will depend on their implementation of the HUI protocol.

DAW Controller Features Summary

- Direct access to all major DAW mixing, editing and automation parameters
- Direct control of plug-in settings
- Integral colour TFT display with dedicated control keys
- High resolution rotary encoder (D-Pot) in every channel provides control of DAW pans, sends and I/O routing
- High quality motorised faders to write/replay level moves in your DAW
- Simple switching between console layer and DAW control layer
- Full remote control implementation
- Operation independent of platform or application

Communication with your DAW

The AWS 900+ connects to your DAW via three MIDI ports at the rear of the console. The AWS 900+ emulates three HUI controllers. The HUI protocol is widely supported by DAW manufacturers.

Section 3 details the MIDI connections between console and computer.

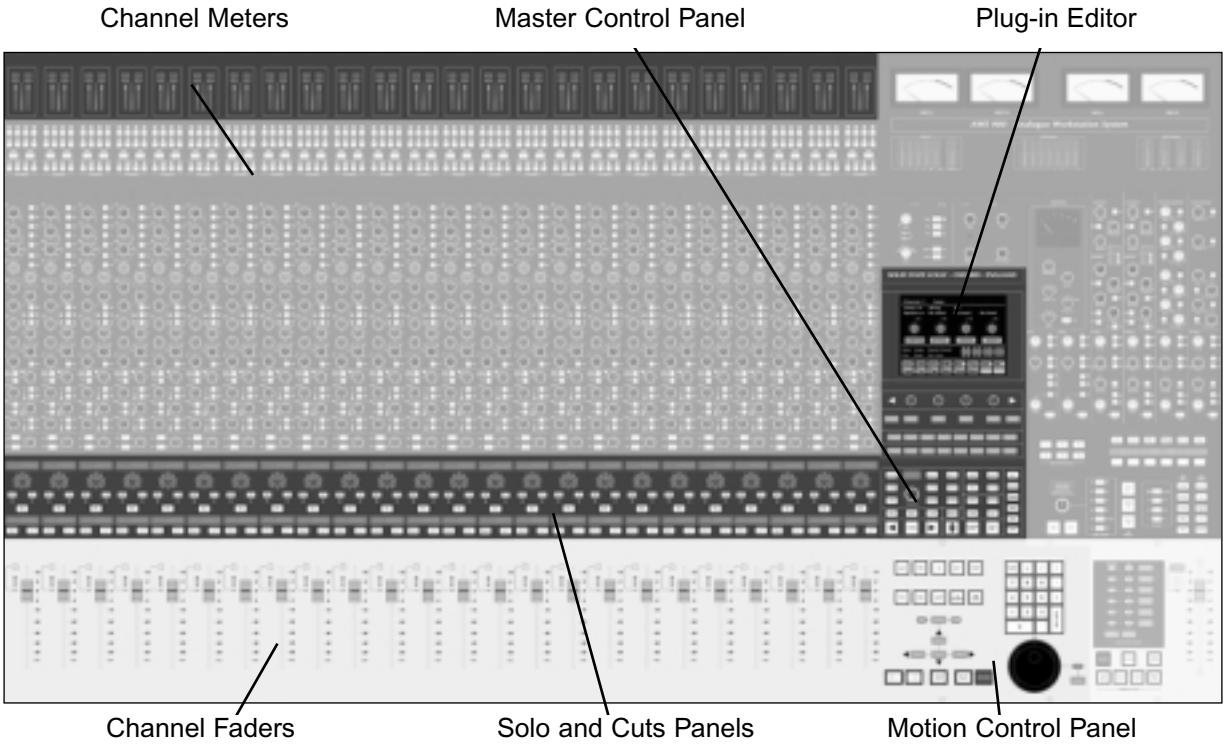
Refer to your DAW manual for information on how to configure your software. Once configured and connected, communication with the DAW will be initialised, and the level of the AWS 900+ channel faders, rotary controls and master functions will be set to match the DAW controls (provided you are DAW Focus mode).

If the AWS 900+ console is not found, your DAW will inform you that a controller is not present. The AWS 900+ display shows the status of the three MIDI connections in the top right hand corner of the screen. A graphic represents the three channel bays and the centre section of the console. Bays without MIDI communications are shown with a red cross through them. Note that AWS 900+ MIDI port 1 connects channels 1-8 and the centre section plug-in editor; MIDI ports 2 and 3 connect channels 9-16 and 17-24 respectively.

If MIDI communication fails on any bay recheck the DAW configuration, MIDI connections and MIDI interface for correct operation.

When using your DAW without the AWS 900+, you should remove the AWS 900+ from the MIDI controllers section of your DAW (please see the information specific to your DAW).

Overview



The AWS 900+ faders and Solos and Cuts panels can be switched between controlling the analogue audio signal path and the DAW using the Focus switch - see below. The Motion Control Panel, Master Control Panel and Plug-in Editor always control the DAW. The illustration above shows the DAW controller elements in 'DAW Focus Mode'. The greyed-out areas indicate analogue-only console elements.

D-Pots

Each channel contains a continuous rotary controller or **'D-Pot'** The Plug-in editor has four D-Pots for control of continuous plug-in parameters.

Console Focus

The console can be set to one of two important modes using the Console Focus button **8** located on the Master Control Panel. This switches the channel meters, faders, solo and cut buttons between control of the analogue signal path and the DAW. When the Console Focus button is illuminated, the AWS 900+ is in 'Analogue Focus Mode'. When the focus mode button is *not* illuminated, the AWS 900+ is in 'DAW Focus Mode'.

This section describes the operation of the console in DAW Focus Mode.

Analogue Focus Mode

The channel faders control the channel audio output level for that fader. The channel meters indicate analogue input level to that channel. The channel D-Pots are available to control DAW parameters.

DAW Focus Mode

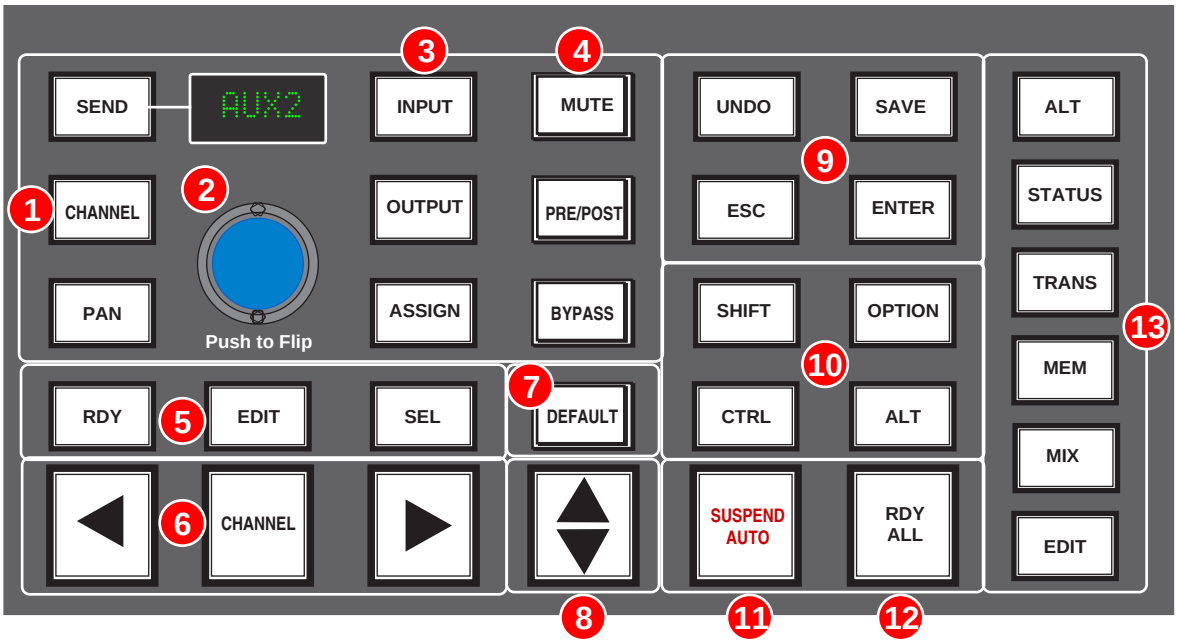
The channel faders control the DAW fader levels. The meters indicate DAW track levels. The channel D-Pots are available to control other DAW functions such as pan or send level.

Digital 'In-line' Mode

When the console is in DAW Focus Mode, analogue level control can be assigned to the D-Pots by pressing the **CHANNEL** button **1** in the Master Control Panel. This allows the modern equivalent of a classic 'In-Line' console design, but in this case the monitor mix is created using the DAW digital mixer.

The Master Control Panel

The Master Control Panel includes a mixture of master functions and modifier keys for control of a DAW.



Channel Banking Controls 6

The AWS 900+ console has 24 touch sensitive moving faders, however, if the DAW session has more faders than this, the AWS 900+ can 'bank flip' its faders to control any number of virtual faders within the DAW.

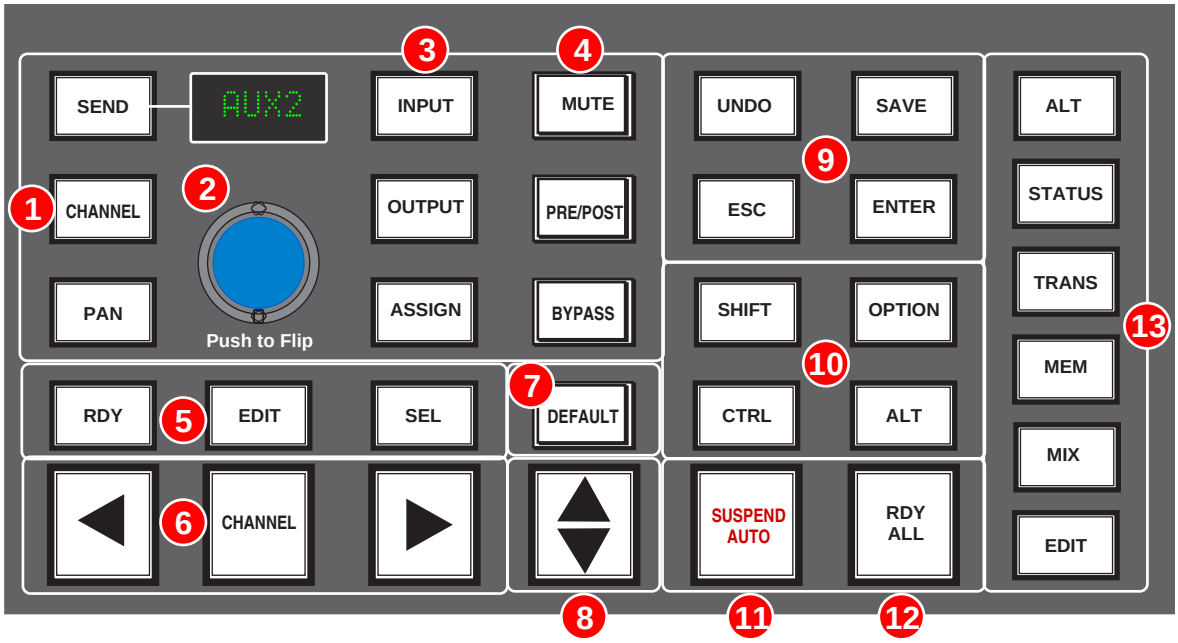
To flip the 24 console faders to the next set of 24 DAW faders, press the right bank button. To flip back to the previous 24 faders press the left bank button. Any number of virtual faders can be controlled from the AWS 900+ using the banking buttons.

To scroll the faders one at a time, press the **CHANNEL** button (located between the two banking arrow buttons) followed by the left or right banking buttons; the **CHANNEL** button will light to indicate it is in 'Channel' mode. Press the **CHANNEL** button once more to switch back to 'Bank' mode.

DAW Window Buttons 13

This group of keys provide instant access to the various windows within the DAW. Press them once to display or hide the relevant menu.

ALT	Opens or closes the floating window for the currently selected plug-in.
STATUS	Opens or closes the Session Setup window.
TRANS	Opens or closes the Transport window.
MEM	Opens or closes the Memory Locations window.
MIX and **EDIT**	Brings the window to the foreground. The button lights to show the currently active window.



DAW Utility Buttons 9

This group of four buttons provide shortcuts to useful functions in the DAW.

SAVE will light when unsaved data is present. Pressing it once will cause the SAVE button to flash. A second press will Save the Pro Tools session. Press ESC to cancel a pending Save.

The **UNDO** button will light if undo is available and flash if redo is available. Press the **UNDO** button to Undo the last function and press **ALT + SHIFT + UNDO** to Redo the last function.

ENTER duplicates the function of the ENTER key on the computer keyboard.

ESC(ape) duplicates the function of the ESC key on the computer keyboard.

Modifier Buttons

These buttons modify the funct 10 of other buttons. Their function is detailed in the relevant sections of the manual.

OPTION typically changes the function of a single button to affect all similar buttons. Thus holding down **OPTION** and pressing a channel **CUT** button will cut all DAW channels. It is a direct equivalent of the Macintosh Command key.

SHIFT allows selection of multiple objects or controls. It is a direct equivalent of the computer keyboard Shift key.

ALT increases the resolution of rotary controls and inverts switch selections when held down. It is a direct equivalent of the Macintosh keyboard Option key.

CTRL disengages grouping when held down. It is a direct equivalent of the Macintosh keyboard Ctrl key.

The Default Button 7

Faders, pans and sends can be reset to their default values using the **DEFAULT** button:

Resetting Pans

Select the **PAN** button on the Master Control Panel, and all 24 D-Pots become pan controls. Hold the **DEFAULT** button while pressing the D-Pot on the channel you wish to reset. Hold down **OPTION** and press **DEFAULT** to perform a reset across all pans.

Resetting Faders

Hold the **DEFAULT** button while pressing the **(SELECT) SEL** button on the channel you wish to reset. Hold down **OPTION** and press **DEFAULT** to perform a reset across all faders.

Resetting Sends

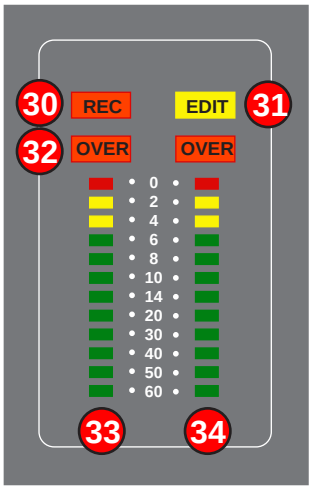
Select the **SEND** button on the Master Control Panel. Turn the Master D-Pot to scroll through the list of available sends. Hold the **DEFAULT** button while pressing the channel D-Pot on the channel you want to reset. Hold down **OPTION** and press **DEFAULT** to perform a reset across all sends.

Resetting Plug-ins

Hold the **DEFAULT** button and press **COMPARE** (the Plug-In Editor function). The plug-in default value is either the factory setting or user setting determined within the DAW.

Channel Functions

In DAW focus mode the channel meters, faders and part or all of the Solo and Cuts tile control the DAW and display its status.



DAW Meters 33 34

When in DAW focus mode, the 24 stereo channel meters indicate the level of the DAW signal path. Mono tracks are displayed on the left meter only. When a signal reaches 0dBFs, the corresponding **OVER** 32 tally will light to indicate that the DAW signal level has clipped.

These meters duplicate the function of meters within your DAW, and show the same information. The meters also follow DAW pre or post fader meter settings, as set within the DAW.

*TIP: OVER tallies can be reset using the **F1** function in the **Fkys** softkey menu*

Status Indicators

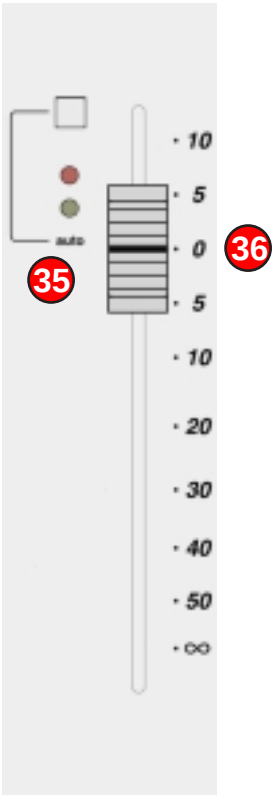
The meter shows the status of the corresponding DAW track.

REC 30 flashes when the track is in record ready and lights when the track is in record.

EDIT 31 indicates that the track is selected for editing with the plug-in controller.

Multi-channel Metering (TDM Systems Only)

Multi-channel metering can be displayed by pressing **OPTION** + **SOLO** on a selected multichannel track. The next two stereo meters are used to show the additional information. Normal metering functionality resumes after deselecting the **SOLO** function.



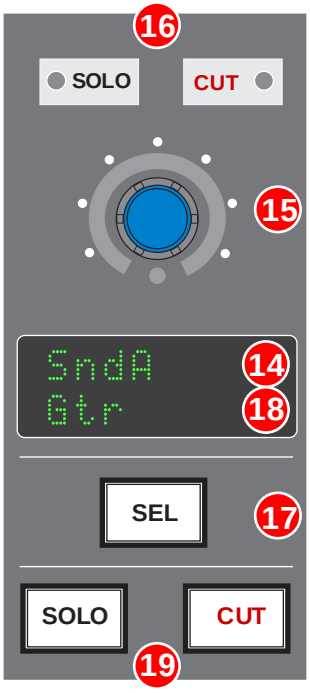
Channel Fader

The channel fader can control any virtual DAW fader including Channel, Master, Auxiliary, MIDI tracks or Instrument tracks. The calibration of the fader will depend upon the DAW (please refer to your DAW manual for more details). Pressing **ALT** will display the gain of the DAW fader on the fader scribble strip when you move the fader.

Fader Grouping

Channel faders will follow any grouping enabled within your DAW. Faders can be disengaged from a fader group simply by holding down the **CTRL** button or by touching one fader in a group while adjusting another fader's level. Relative fader levels are maintained upon release of the fader.

Channel Solo and Cut Tile



Channel D-Pot 15

Each channel has a continuous controller or D-Pot. This can be used to control Send levels and Panning, and to assign Input, Output and Send routing. See page 5-9 for more details.

The D-Pot includes a push switch that is used (depending on the centre section mode) to select sends to be pre or post fade, to mute sends and to confirm I/O selections. See page 5-10 for more details.

Solo and Cut Buttons 16 19

Two sets of Solo and cut buttons are provided on each channel. The upper set is associated with the signal path controlled by the channel D-Pot and the lower set with the signal path under fader control. Thus in Analogue Focus mode and with CHANNEL mode selected the lower set of buttons control the analogue path and the upper the DAW channels. Changing to DAW Focus reverses this.

When a DAW solo is active the cut buttons on the other channels flash.

Holding down **OPTION** and pressing a channel **SOLO/CUT** button will select/deselect that function across all channels. If channels are already solo'd then this will turn off all solo buttons, making this a quick way to clear solos.

Solo Isolate

Holding down **ALT** and pressing a channel **SOLO** will put a channel into Solo Isolate mode. This mode prevents that channel from being cut when a **SOLO** is activated on another channel. This is particularly useful for FX return tracks.

Channel Select Button 17

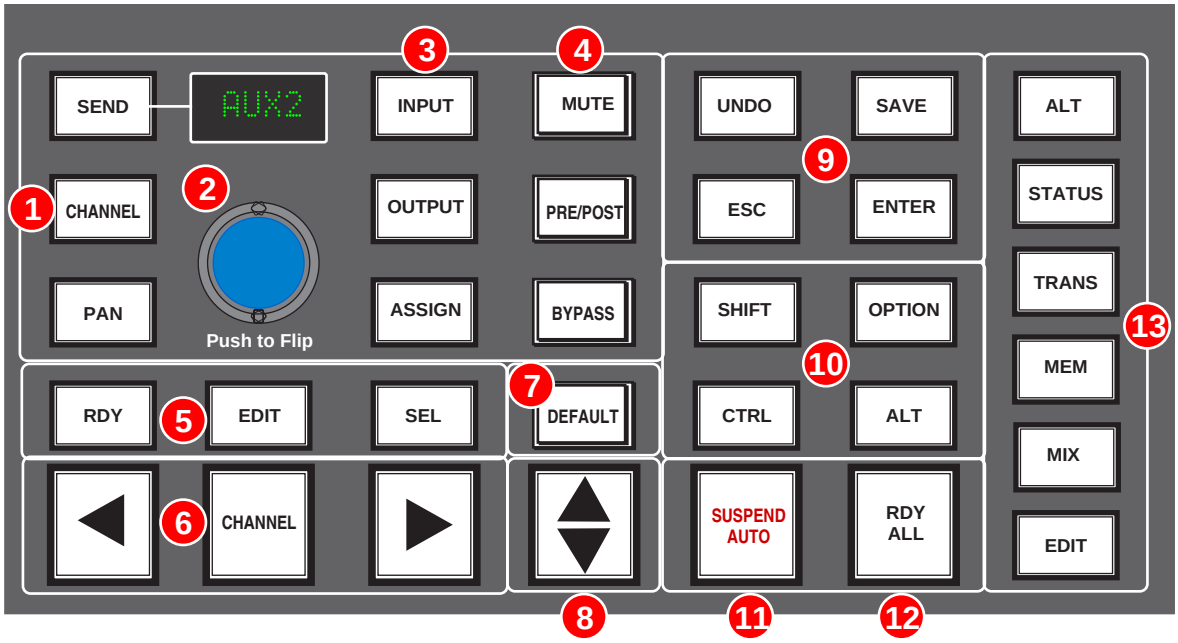
The channel **SEL** button can function as a channel select button, a track record enable or a plug-in edit enable button, depending on the mode selected on the Master Control panel 5. See page 5-8 for more details.

Scribble Strip Displays 14 18

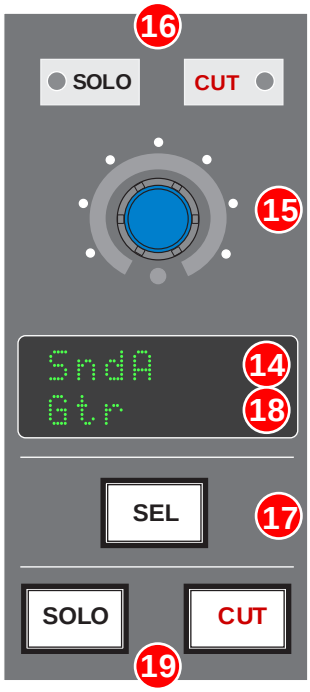
When an AWS 900+ channel fader is controlling a DAW fader level, the channel scribble strip will indicate a four character version of the DAW channel name. When controlling the analogue channel it displays the number of the fader, eg 'Fader 23'.

The scribble strip can also display other information such as: Automation status, Grouping information, Monitor information (see page 5-20), Input/Output routing, Send routing, Send Pre/Post information (see page 5-11), fader level display (see page 5-6) and Pan position (see page 5-9).

The D-Pot scribble strip displays the DAW channel name or analogue fader number in **CHANNEL** mode or the selected function (Pan, ASGN etc) in other modes.



Channel SEL Button – Track Arming/Edit/Select 5



The function of the channel SEL 17 button depends on the mode selected on the centre section RDY, EDIT and SEL keys on the Master Control Panel.

Record Ready Mode 5

If **RDY** is selected all 24 channel **SEL** buttons become Record Ready buttons. Pressing a channel **SEL** button puts the DAW track into Record Ready (provided that the DAW track has an input routed). The **REC** tally above the meter flashes to show that the track is in ready.

Ready All

Track arming can be set or cleared across all channels by using the master RDY ALL button. This button flashes if any DAW tracks are in Record Ready. Pressing this switch while it is flashing will clear all track arming.

Record Safe

To put a DAW track into Record Safe (so it cannot be put in to Ready) hold down **ALT** and press the channel **SEL** button. Hold down **ALT + OPTION** then press any **SEL** button to set all tracks to Record Safe.

Edit Mode 5

With **EDIT** mode selected the channel **SEL** button can have a number of functions:

Provided **BYPASS** 4 is off pressing one of the channel **SEL** buttons assigns the plug-in editor to that channel. The **EDIT** tally on that channel will light to confirm that this is the **EDIT** channel. See page 5-18 for more details on the plug-in editor.

A double press on the **SEL** button will select the first plug-in in that channel for editing. Successive double presses will select the next plug-in in that channel.

Selecting the **BYPASS** 4 button on the Master Control Panel changes the channel **SEL** buttons to **BYPASS** buttons. Pressing a channel **SEL** switch will bypass *all* plug-ins on that channel. The channel **EDIT** flag will light to show that all plug-ins are bypassed.

Select Mode 5

All 24 channel **SEL** buttons become track select buttons. They perform the same function as clicking with the mouse on a channel in the DAW.

A double click on a **SEL** button will open the channel naming pop-up for that channel.

Multiple channels can be selected by holding down the **SHIFT** button while selecting further **SEL** buttons or by holding down the first **SEL** button you pressed while you select more channels. Note that this last method only works within blocks of channels corresponding to a single HUI interface.

Hold down **OPTION** and press any **SEL** button to select all channels.

Hold down **ALT and** press any **SEL** button to invert the state of all select buttons.

Working with the Channel D-Pots

The channel D-Pots can control DAW channel pan, Send (Aux) levels and pan, routing assignment and analogue audio levels. Each D-Pot also has a switch which is activated by pushing down on the D-Pot.

The channel D-Pot function is selected on the Master Control Panel by the Master Send D-Pot 2 and six associated buttons 1 3 The scribble strip above the channel D-Pots shows which function is currently selected. A further two buttons (**PRE/POST** and **MUTE**) 4 change the function of the D-Pot push switches.

Pan Mode 1

Select **PAN** mode and the channel D-Pots become pan controls for the DAW. The D-Pot scribble strip displays '**Pan'.**

Pressing the **PAN** button on the Master Control Panel a second time (it flashes in this mode) allows you to access a second pan control for stereo channels according to your DAW configuration.The D-Pot scribble strip displays '**Pan R'** in this mode.

Press the PAN button again to return to normal pan mode.

When panned centrally, a green LED appears just beneath the channel D-Pot.

Holding down **ALT** displays a pan's numeric value on the channel scribble strip when you adjust the control.

Channel Mode 1

Select **CHANNEL** mode and the channel D-Pots control the analogue gain of the channel strip.The D-Pot scribble strip will display the analogue fader number (eg 'Fader 12').

Switching to Analogue Focus mode will swap the analogue gain and the DAW gain between D-Pot and channel fader. Individual channels can be swapped by pressing the channel D-Pot.

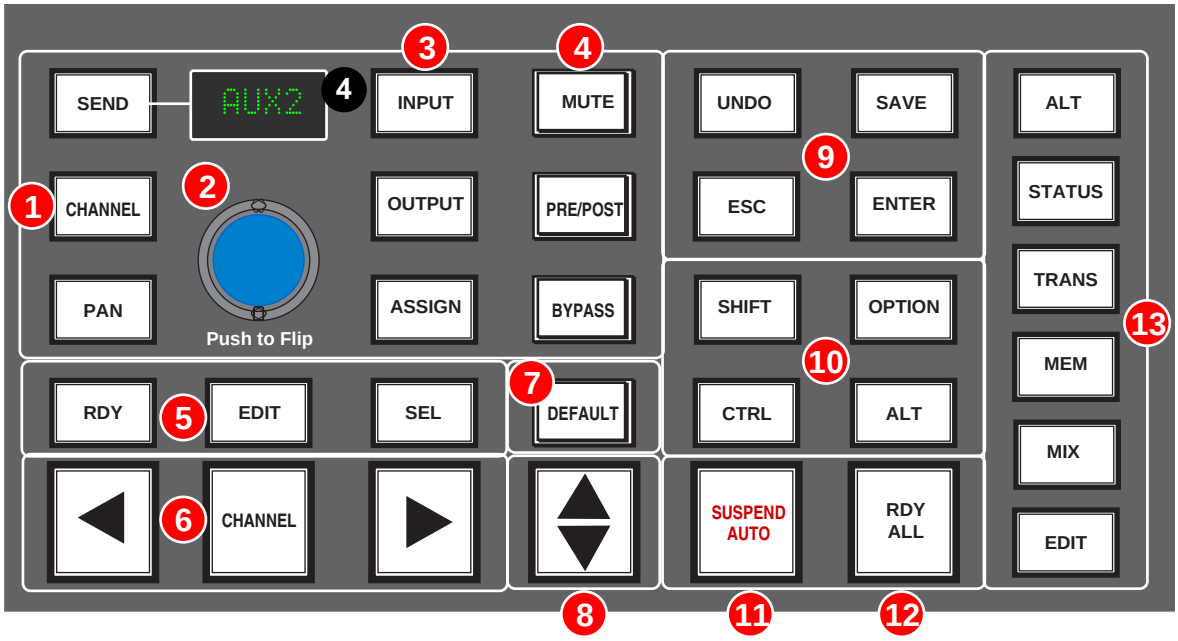
Send Mode 1

Select **SEND** mode on the Master Control Panel and the D-Pots become level controls for any sends or aux send levels within the DAW.

The Master Send D-Pot 2 selects which of the available sends (A-E or 1-5) is being controlled by the channel D-Pots. The selected send is shown in the display window above the Master Send D-Pot (and on the channel D-Pot scribble strip).

The channel D-Pot scribble strips show the name of the currently selected send. Turning a channel D-Pot will alter the level of the selected send from that channel. Holding down the **ALT** button allows you to make fine adjustments to the gain.

See page 5-10 for information on using faders to set Send levels.



Setting Sends Pre/Post Fader

When working with sends it is useful to be able to flip a send between pre and post fader.

If necessary select the **PRE/POST** button 4 on the Master Control Panel.

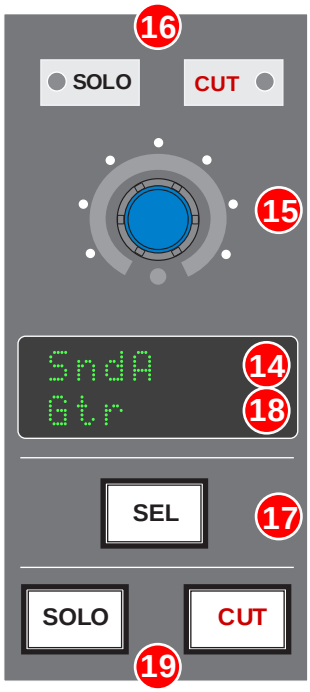
Pushing a channel D-Pot will now switch the selected send on that channel between pre and post.

The green LED below the D-pot lights to show PRE is selected.

To change mode on all channels press and hold the **OPT** button then press any channel D-Pot. All channels will switch to Pre or Post.

Muting a Send Output

To mute a send output select the **MUTE** button 4 on the Master Control Panel and push the channel D-Pot. The green LED below the channel D-Pot will light to show the channel is muted.



To mute or un-mute all channels press and hold the **OPT** button then press any channel D-Pot. All channels will mute or un-mute.

Flipping Send Levels to the Faders

To flip Send levels from the D-Pots to the channel faders, press the Master Send D-Pot 2 marked 'Push to Flip').

The channel faders now control the send levels and the fader **CUT** button will mute the send.

The channel D-Pot controls panning on stereo sends.

In this mode **PRE/POST** mode is automatically selected for the D-Pot switches, so pushing a D-Pot will toggle the Send pre/post selection on that channel. The green LED below the D-Pot lights to show PRE is selected.

The fader **SOLO** button will solo the channel, not the send.

Input, Output and Send Routing

The channel D-Pots can also be used to assign signals to inputs, outputs and aux sends of your DAW mixer:

Viewing Input, Output and Send Routing

The Input, Output or Send routing for all DAW channels can be displayed on the channel scribble strip by holding down the **INPUT**, **OUTPUT** or **SEND** button on the Master Control Panel. The Master Send D-Pot can be used to select which of the available sends you wish to display.

Setting Input, Output and Send Routing

To make or change an Input, Output or Send assignment:

1. Select **ASSIGN** + **INPUT** or **OUTPUT** or **SEND** on the Master Control Panel.

   When using SEND select which send you wish to change from the available send slots using the Master Send D-Pot **2**

2. The D-Pot scribble strip will now read **ASGN** and the fader scribble strip will indicate the current routing for the DAW channel.
3. Turn a channel D-Pot to scroll through a list of available DAW inputs or outputs (names are derived from the DAW I/O settings not the AWS 900+). The list will appear in the channel scribble strip. The green LED below the D-Pot will flash.
4. Push the D-Pot knob to select the current assignment; the green LED will become solid and a '>' symbol will appear in front of the assigned signal (for example, '>Out3-4').
5. Press the **ASSIGN** button once more to exit assign mode. This will also commit any changes made that have not been confirmed by pressing the D-Pot.
6. Pressing **ESC** at any time will abort the assignment process.

Assigning Signals to Multiple Channels

Holding down **OPTION** then pressing any channel D-Pot will assign that channel's input to all channels.

Holding down **SHIFT + OPTION** will assign that channel's input to all selected channels. Select **SEL** mode on the Master Control Panel then press the **SEL** buttons on the channels you wish to route to.

Holding down **OPTION** and **ALT** then pressing a channel D-Pot will incrementally route that channel's input to all channels. For example, selecting input 1 as the input to channel 9, then holding down OPTION and ALT before pressing the channel 9 D-Pot will route input 1 to channel 9, input 2 to channel 10, input 3 to channel 11 and so on across the entire DAW.

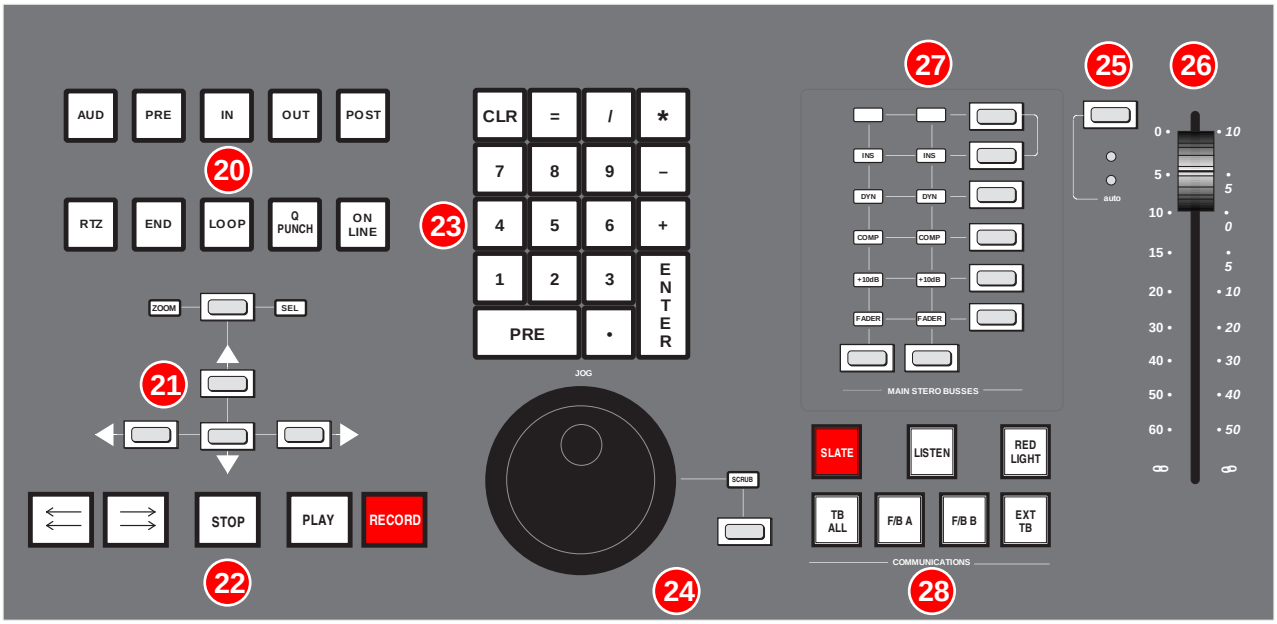
Holding down **SHIFT + OPTION+ ALT** will incrementally route that channel's input to all selected channels. Select **SEL** mode on the Master Control Panel then press the **SEL** buttons on the channels you wish to route to.

Assigning a Channel to Multiple Outputs

Hold the **CTRL** button and select another output. The currently assigned output will have a '>' symbol before it (for example, '>Out3-4'), and other added outputs will have a '+' (for example '+Out5-6') until you assign it.

In the scribble strip, an '@' symbol indicates that an item is inactive (ie routed but muted). The '$' symbol indicates that more than one output is assigned, and at least one of those is inactive.

Motion Control Panel



Transport Controls 20 22

Dedicated transport controls are provided for direct control over your DAW:

ONLINE* Puts the DAW on line for synchronisation

LOOP* Toggles Loop mode on/off (hold down **CTRL** for Loop Record mode)

Q PUNCH* Toggles Quickpunch recording status on/off for your DAW

PRE* Toggles the pre-roll function for your DAW. See next page for setting Pre roll time

POST* Toggles the post -roll function for your DAW. See next page for setting Post roll time

*The status of these functions is shown in the transport section of the TFT screen.

IN Captures the current DAW position as the Start edit time.

OUT Captures the urrent DAW position as the End edit time.

RTZ (Return-To-Zero) Returns the playback cursor to the Session start time

END (Go-To-End) Moves the playback cursor to the end of the Session

REWIND Holding down this button will rewind the DAW (increment depends upon Display mode)

FAST FORWARD Holding down this button will fast forward the DAW (increment depends upon Display mode)

STOP Stops playback or recording

PLAY Depending on the Pro Tools settings c ommences playback from the current cursor position or the last locate point, depending on DAW settings.

RECORD Engages DAW recording for currently armed tracks

Other useful transport modes

Half-speed Playback	**SHIFT** + **PLAY**
Abort Current Record Pass	**SHIFT** + **STOP**
Cycle through Record Modes (Normal, Quickpunch, TrackPunch, Loop)	**CTRL** + **RECORD**
Cycle through Machine Control Masters (accessible via the transport window)	**CTRL** + **ONLINE**
Link or Unlink the Edit and Timelines	**SHIFT** + Back slash(**) 23

20 Setting Pre and Post Roll

Hold down **ALT** and press the **PRE** or **POST** button to highlight the left hand numeric field of the **pre-roll** or **post-roll** time window. The time is displayed on the AWS 900+ TFT screen in place of the DAW position. The selected numeric field will flash. Use the navigation left/right arrow keys to select a different numeric field if required, then enter a value on the numeric keypad or use the Up/Down arrow keys to increase or decrease the selected field. Press **ENTER** to confirm the time.

The **CLR** button on the numeric keypad can be use to clear the selected time.

20 Setting start (In) and end (Out) Times

Hold down **ALT** and press the **IN** or **OUT** button to highlight the left hand numeric field of the **start** or **end** time window. The time is displayed on the AWS 900+ TFT screen in place of the DAW position. The selected numeric field will flash. Use the navigation left/right arrow keys to select a different numeric field if required, then enter a value on the numeric keypad or use the Up/Down arrow keys to increase or decrease the selected field.

Press **ENTER** to confirm the time.

The **CLR** button on the numeric keypad can be use to clear the selected time.

Audition 20

This function allows the **IN**, **OUT**, **PRE** and **POST** points to be checked.

Select the **AUD** button then press either the **PRE**, **IN**, **OUT**, or **POST** button. Press the **AUD** button again to cancel the function..

When Audition mode is selected the transport section of the TFT screen displays **audition** in place of the **Pre** and **Post** indicatiors.

PRE	Plays from the **pre-roll** point to the selection **start** point
IN	Plays from the selection **start** point for the **post-roll** time
OUT	Plays from the **end** point less the **pre-roll** time to the **end** point
POST	Plays from the selection **end** point for the **post-roll** time
ALT + **OPTION** + **PRE** or **IN**	Plays from the selection **start** point less the **pre-roll** time to the selection **start** time plus the **post-roll** time
ALT + **OPTION** + **POST** or **OUT**	Plays from the selection **end** point to the selection **end** point plus **post-roll** time.

AWS 900+ Footswitch Control

The AWS 900+ has two 6.35mm jack footswitch connectors on the rear of the console (see Section 3). These are intended for hands-free access to essential transport functions:

Footswitch Control One:

Either plays or stops the DAW. Holding down **SHIFT** will abort a recording if in record, or initiate half-speed playback if stopped.

Footswitch Control Two:

Is used to activate or deactivate Record mode. Holding **CTRL** while pressing the foot switch will cycle through record modes.

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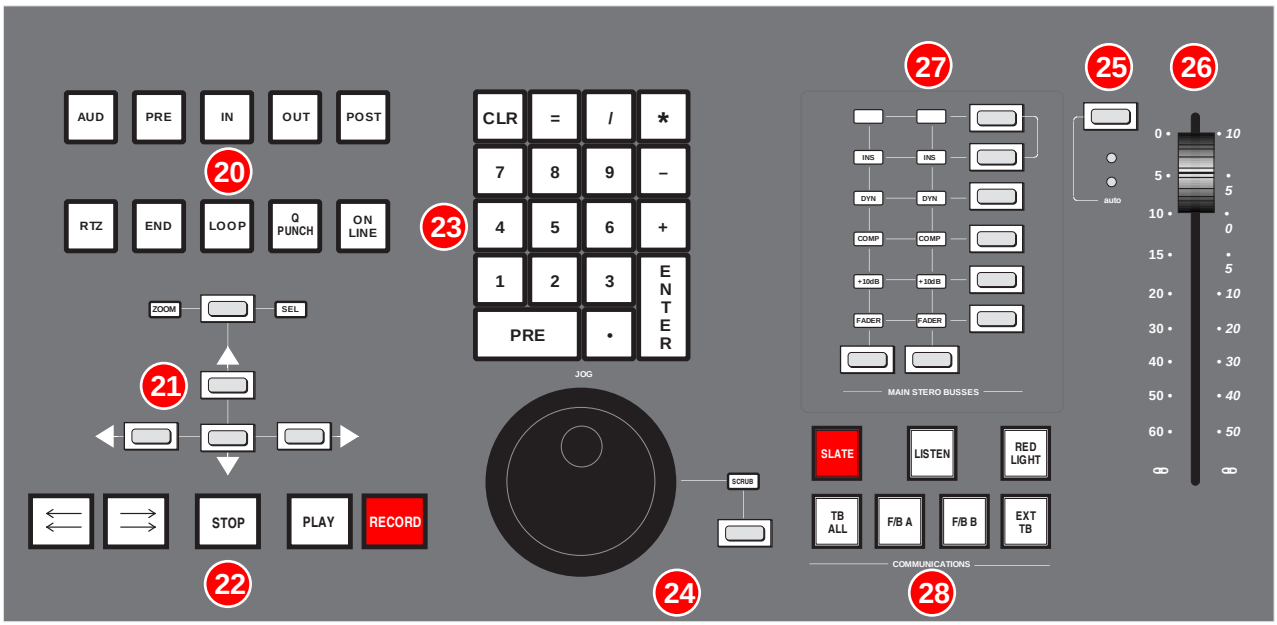


Zoom, Navigation and Selection Modes 21

The Motion Control panel has a section with four arrow keys and a **ZOOM**/**SEL** button that toggles the selection of three available modes: **Navigation Edit**, **Zoom** and **Select**.

Navigation Mode (Neither Zoom or Select lit)

In this mode the arrow keys can be used to select a region or regions on your DAW.

The left and right arrows will snap to region/clip boundaries. The up/down arrow keys move the cursor to the track above or below respectively. Holding down the **SHIFT** modifier button will allow a selection to be extended in any direction. Holding the **OPTION** button allows the current selection point to be centred on the screen.

Holding **CTRL** + **Up/Down/Left/Right** arrow button allows you to change and extend the region/clip selection. Holding **SHIFT** also includes either the previous or next region.

Zoom Mode (Both Zoom and Select lit)

The arrow keys now become horizontal and vertical zoom controls for the edit/arrange window on your DAW.

Fixed edit/arrange zoom settings can be saved or recalled from the AWS 900+ numeric keypad:

To save a zoom setting – press **SHIFT** + numeric keypad number

To recall a zoom setting – press **OPTION** + numeric keypad number

Selection Mode (Both Zoom and Select flashing)

In this mode the arrow keys provide a way to create and edit selections within your DAW program.

To create a selection, press and hold either the left or right arrow button and move the inner shuttle wheel, to adjust the start or end point for the selection. The up and down arrow keys will move the selection to the next track. Holding **SHIFT** and using the up/down arrow keys will allow the selection to be extended across multiple tracks.

Holding the left *and* right arrow keys simultaneously while scrubbing retains the selection duration while moving the selection start point.

Pressing **OPTION + Up/Down** arrow button removes the upper or lowermost track from the selection.

Scrolling Within a Window

To page scroll within a currently selected window (ie. Mix/Mixer or Edit/Arrange) press **ALT** + **Left/Right/Up/Down** arrow button to scroll one page in either direction. Holding down **OPTION** and **ALT** scrolls to the window boundary.

Shuttle/Scrub Wheel 24

A dual-concentric Shuttle/Scrub wheel is provided. It has a spring-loaded outer ring and a continuously variable inner wheel for scrub and shuttle functions for the DAW. The wheel can also be used to make and adjust selections on the DAW.

Using the Shuttle Wheel

When the DAW is stopped, turn the wheel to activate shuttle mode. The outer rim will step through seven fixed shuttle speeds, while the inner controller is continuously variable.

Using Scrub Mode

Select a region to scrub within your DAW. Press the **SCRUB** button next to the wheel. The inner wheel now becomes an analogue tape machine style scrub wheel for the DAW.

Using the Numeric Keypad to shuttle

Depending upon the configuration of your DAW system, the numeric keypad 23 can be used to control shuttle speed and direction. Hold down the **CTRL** button followed by a number on the numeric keypad that represents the shuttle speed. The +/- buttons control the direction of shuttle.

Exit from Scrub/Shuttle Mode

To exit from shuttle mode press either the **STOP** or **ESC** button.

Notes on Scrub and Shuttle Modes

The position at which the scrub/shuttle starts is derived from the current DAW selection or timeline position. Scrub/Shuttle mode can commence from the selection end point by holding down the **OPTION** button before you you grab the shuttle wheel.

Holding down the **ALT** button will increase the resolution of the scrub/shuttle wheel.

When scrub or shuttle is active, many functions are suspended until you exit from scrub/shuttle mode. The following functions *are* available:

Fader control, solo and cut buttons

Scrub/Shuttle wheel functions

Transport controls

Enter button (to create marker/cue events)

Scrub/Shuttle will also control serial machines if the DAW is 9-pin enabled.

Numeric Keypad 23

The console's numeric keypad replicates the numeric keypad on your DAW keyboard. The primary use for this keypad is for saving and recalling Memory Locates and entering data values (please refer to your DAW manual for more details on keypad uses)

Working with Markers/Memory Locations

To Enter a Marker/Cue point – press **ENTER**.

To Recall a Marker/Cue point – press a number followed by the decimal point button (Numeric Keypad in Classic mode) or a decimal point followed by a number followed by the decimal point button (Numeric Keypad in Transport mode).

Note: The ENTER button on the keypad also works as a enter button for pop-up windows, duplicating the ENTER button on the Master Control Panel.

Plug-In Editor

The AWS 900+ comes with a powerful Plug-in Editor located in the console centre section. From here, plug-ins and hardware inserts can be assigned, and plug-in parameters can be edited.

Plug-In Editor Display

The Plug-In Editor uses a high resolution TFT display, four D-pots and four soft buttons to control the parameters of any plug-in. The display is also used to show the position and status of the DAW and to provide access to a range of paged menus. These are described on page 5-19.

The currently selected EDIT channel name is displayed at the top of the screen. Next are the plug-in control displays. Just below this are the transport status displays and timecode display.

The bottom section is used for soft key menu selection.

Plug-In Editor Controls

The controls for the display are located just below the screen area. The four D-Pots and associated soft keys map to the corresponding controls on the display. The D-Pots also have push-push select switches which perform various functions.

The display also shows information from the DAW at the top of the editor display.

Paging Buttons

The left/right paging buttons page through either available insert slots in **INSERT** mode, or plug-in parameters in **PARAMETER** mode (see below).

Selecting a DAW Channel for Plug-In Control

Select **EDIT** mode on the Master Control Panel then use the channel **SEL** buttons to chose the channel you wish to edit. The **EDIT** flag in the channel meter will light. The DAW will highlight the selected channel and currently selected plug-in. Press **ALT** to display the plug-in window.

Alternatively select a channel by double clicking on one of the insert points in the Mix window. Note that on some versions of Pro Tools this is the only way to change between blocks of channels (1-8, 9-16, 17-24).

*Note: Bank switching channels leaves the Plug-In Editor with the channel assigned to it. The channel **EDIT** tally will show this.*

Timecode/Bars & Beats/Samples Display

The on-screen time readout can be assigned to display either Timecode (SMPTE/EBU), Feet/Frames, Bars/Beats or samples. This display will follow the setting selection made within your DAW. Please refer to your DAW manual for further details.

DAW Status Display

To the left of the timecode display is the DAW status display. This shows the following flags:

Solo	DAW has a Solo active
Loop	DAW has Loop enabled
QPunch	DAW has QuickPunch selected
Pre	DAW transport has pre-roll enabled
Post	DAW transport has post-roll enabled
Solo	DAW has a Solo active
Audition	DAW is in Audition mode. This is displayed in place of the **Pre** and **Post** flags

Plug-In Display Modes

There are three display modes, **Insert, Parameter** and **Assign**, which are selected with the **ASSIGN** and **INSERT/PARAM** buttons below the D-Pots.

Viewing Current Inserts (Insert Mode)

Press the **INSERT/PARAM** button till the **INSERT/PARAM** box reads **INSERT**; the plug-in editor is in **Insert** mode. In this mode the four D-Pots represent four insert points on the selected channel. The currently assigned plug-ins are displayed above each D-Pot. The name of the currently active plug-in will flash.

Additional insert points can be displayed using the paging buttons.

The four D-Pot push switches can be used to select an insert slot for editing or for plug-in assignment - see below.

Assigning a Plug-In or Hardware I/O Insert (Assign Mode)

Note: Some DAW applications will not allow assignments to be made during playback, or recording.

To Assign a Plug-in to a Channel Insert Point:

1. Press the **ASSIGN** soft button to enter assign mode; the on-screen box flashes to confirm this.
2. Press the D-Pot corresponding to the insert slot which you wish to route to a plug-in (use the paging buttons if necessary) then use the D-Pot to scroll through a list of plug-ins and I/O slots. The names that are displayed are derived from the DAW.
3. To confirm the assignment either:
   a. Press the **ASSIGN** button a second time. This will exit **INSERT** mode and switch the Plug-In Editor to **PARAMETER** mode for editing of the last selected insert.
   b. Press the D-Pot used to make the assignment. This will confirm the assignment and leave you in Assign mode so you can make further assignments.

Assigning the Same Plug-in to All Channels

Follow steps 1 and 2 above to select a plug-in, then hold down the **OPTION** button before pressing the D-Pot switch to assign a plug-in to all channels.

Assigning The Same Plug-in to Selected Channels

To assign a plug-in to selected channels select **SEL** mode on the Master Control Panel then choose the channels you wish to assign to by holding down **SHIFT** and pressing the channel **SEL** keys.

Follow steps 1 and 2 above to select a plug-in, then hold down **OPTION** + **SHIFT** before pressing the D-Pot switch to assign the plug-in to the selected channels.

Editing Plug-In Parameters (Parameter Mode)

Selecting a Plug-In to Edit

In **Insert** or **Assign** mode press the plug-in D-Pot for the insert you wish to edit *or* in Insert mode select **Parameter** mode by pressing the INSERT/PARAM soft button.

To exit from **Parameter** mode press the **PARAM** soft key (if you want to edit a different plug-in) or the **ASSIGN** soft key (if you want to change assignment).

Changing Plug-in Parameters

Once you have selected a channel and a plug-in for editing, the four D-Pots and their switches control the on screen parameters derived from the DAW plug-in. The names of the currently selected controls and their values are shown above the on-screen D-Pots.

The **PAGE UP** and **PAGE DOWN** buttons can be used to access all the plug-in controls.

Hi-Resolution Parameter Display Mode

Holding down the **OPTION** button while editing a plug-in parameter will show a 9-character version of the parameter value at the top of the Plug-In Editor display.:

*The **ALT** button can be used to open or close the plug-in/pop-up window at any time.*

Comparing Your Changes

Pressing the **COMPARE** button allows you to compare any changes made to plug-in parameters with the values stored before editing.

As soon as you change any parameter the **COMPARE** box will turn yellow.

Pressing the **COMPARE** button toggles between the settings when you starting editing parameters and the current settings.

Note that the plug-in window must be opened before this function becomes available.

Bypassing Plug-ins

The **BYPASS** button allows a plug-In to be toggled in/out of the signal path in **PARAM** mode. In **INSERT** mode, individual plug-ins can be bypassed by holding down the **BYPASS** button and pushing the D-Pot that corresponds to the insert you want to bypass.

The channel SEL switch can be used to bypass all the plug-ins on a channel - see page 5-8.

D-Pot Sensitivity

The D-Pots for the Plug-in Editor can be set to one of two modes: **Fixed** or **Velocity-sensitive**. In **Fixed** mode, turning a knob will range through the whole list of available parameters. This makes it very quick to search through long lists. Holding down the **ALT** button will enable a finer resolution scroll.

In **Velocity-sensitive** mode the speed of scrolling is dependent upon how quickly you turn the D-Pot. To toggle between the two modes press the **F5** button in the **Fkys** menu.

Note that the channel D-Pots only operate in Fixed mode.

Soft Key Display

The Plug-In Editor includes an 8x8 matrix of soft buttons which map to the 16 boxes at the bottom of the plug-in display:
The top row (buttons 1-8) allow selection of the labelled function. Once pressed, a sub-menu will appear for the second row of soft key buttons (9-16). The menus are ordered as follows:

1. Automation Enables

AuEn	AuMo	EdTs	EdMo	StGr	Fkys	Edit	SSL
Fader	Pan	Plgin	Mute	Send	Mute		

Automation Enable modes (**AuEn**) globally engage or disengage automation for the following items: **Faders**, **Pans**, **Plug-Ins**, **Mutes** (cuts), **Sends** and **Send Muting**. See page 5-22 for more details.

2. Automation Modes

AuEn	AuMo	EdTs	EdMo	StGr	Fkys	Edit	SSL
Trim	Latch	Touch	Write	Read	Off		

Automation Modes **(AuMo)** sets the update mode for each channel or group of channels. See page 5-22 for more details.

3. Edit Tools Menu

Edit Tools **(EdTs)** displays a list of available tools used by your DAW system. For example, in Pro Tools you can select the Zoom, Trim, Select, Grabber, Smart Tool, Scrub and Pencil tools.

4. Edit Modes Menu

Edit Modes**(EdMo)** displays a list of available edit modes used by your DAW system. Within Pro tools® you can select Shuffle, Slip, Spot and Grid modes.

5. Status/Group Menu

The Status/Group **(StGr)** menu contains several useful functions including:

Auto – Shows the Automation status of all channel faders on the channel fader scribble strips.

Monitor – Shows the monitor status of all 24 focused channels on the fader scribble strip. The labelling is as follows:

Auto	Auto input mode
Inpt	Input mode only
Aux	Auxiliary input channel
MIDI	MIDI channel
Mstr	Master Fader
Phase	Not implemented

Group – Shows the grouping status of all 24 focused channels on the console. A lowercase letter indicates that the fader belongs to that group. An uppercase letter indicates that the fader belongs to multiple groups, with the foremost group ID being displayed – eg. B for groups b, c and e.

Create – To create a fader group for your DAW, select **SEL** mode on the Master Control Panel then hold down the **SHIFT** button and press the **SEL** buttons on any channels you wish to group. Finally press the **CREATE** button and a new group will be created.

Suspend – Fader/Mix groups can be suspended at any time by selecting **SUSPEND**; they are now disengaged from their respective grouping arrangements. Pressing **SUSPEND** a second time re-enables the groups.

6. Function Keys

The F-Keys **(Fkys)** menu gives acess to the DAW function keys. The use of the function (F) keys can vary between DAW applications. A standard configuration for Pro Tools® is :

F1 Peak Hold Clear for the AWS 900+ channel meters

F5 Cycles **Fixed** or **Velocity-sensitive** modes for the D-Pots

F8 Escape

7. EDIT Menu

The Edit **(Edit)** menu provides quick access to frequently used editing functions including **Capture**, **Separate**, **Cut**, **Copy**, **Paste** and **Delete**.

8. SSL Menu

This menu is used to access additional optional AWS 900+ features such as Total Recall. Information regarding these features will be found in the appropriate section of this manual.

Working with Automation

The AWS 900+'s touch sensitive moving faders can be used to write automation for the DAW fader. Most automation functions can be enabled from the soft key matrix below the console's display screen. Within this are menus for Automation Enables, Automation Modes, Grouping and Editing functions.

Note: Automation data can usually only be written when the DAW is in Play, Half-Speed Play or Record.

Automation Enables

AuEn	AuMo	EdTs	EdMo	StGr	Fkys	Edit	SSL
Fader	Pan	Plgin	Mute	Send	Mute		

Automation Enable modes (**AuEn**) globally engage or disengage automation for the following items: **Faders**, **Pans**, **Plug-Ins**, **Mutes** (cuts), **Sends** and **Send Muting**. Holding down the **OPTION** button then pressing any of the sub menu buttons will toggle automation on or off for all controls.

The **Pan** automation enable includes both Channel *and* Send Pan.

Automation Modes

AuEn	AuMo	EdTs	EdMo	StGr	Fkys	Edit	SSL
Trim	Latch	Touch	Write	Read	Off		

There are several Automation Modes (**AuMo**) available including: **Write** (Wrt), **Touch** (Tch), **Latch** (Ltch), **Trim** (Trim), **Read** (Read) and **Off** (Off). Entries in parenthesis ( ) indicate the mode as shown in the channel scribble strip. To change automation mode on a channel select an automation mode from the soft key menu and press the **auto** button on a channel fader. Holding down **OPTION** then selecting an automation mode will change automation modes on all channels.

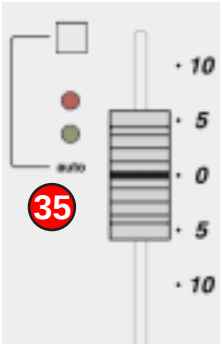
Refer to your DAW manual for more information on its specific automation features.

TRIM Mode

If your DAW supports Trim automation mode, then this can be selected by selecting the **Trim** softkey in the **AuMo** (Auto Modes) menu then pressing a channel **auto** 35 button. This changes the current automation mode into a 'Trim' equivalent. Holding down **OPTION** then pressing Trim in the soft key menu will set Trim mode on all channels.

You can confirm that a fader is in Trim by pressing and holding the fader's **auto** button – its scribble strip will display a T in front of the normal automation mode indication. Alternatively, select the **Auto** softkey in the **StGr** (Status/Groups) menu; this will display automation modes in the scribble strips for all 24 DAW channels.

Automation Status Display



Pressing and holding the **auto** button 35 on a channel fader will display the current automation mode for that channel in the channel scribble strip display. To display the automation mode for all 24 channels on the console, select the Status Group (**StGr**) soft menu, and press **Auto.**

The automation LED indications are as follows:

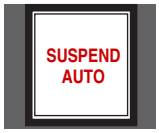
No LED	Automation off
Green LED	Read automation mode
Red Flashing LED	DAW is ready to write automation in write, touch or latch modes.
Red solid LED	Writing automation data
Red and Green LEDs	Trim automation mode

TOUCH OVERRIDE MODE

When writing automation data in 'Touch' mode, as soon as the fader is released, the fader will drop out of write. Uniquely the AWS 900+ allows this to be overridden by pressing the fader **auto** button **35**. This locks the fader touch sense on so the fader continues to write automation even though it is not being touched.

Press the **auto** button again to drop out of write.

SUSPENDING AUTOMATION



To suspend *all* automation writing and playback for the entire project/session, press the **SUSPEND AUTO** button. The button will flash red to indicate that the suspend function is active.

WRITING AUTOMATION (WRITE TO START, END OR ALL)

In some DAW applications you can write automation data to the start, end or whole part of a track/selection in any automation mode. To perform these functions from the AWS 900+ use the following:

CTRL + **RTZ –** Will write automation data from the current position to the start of the track/selection.

CTRL + **END –** Will write automation data from the current position to the end of the track/selection.

CTRL + SHIFT + (END or RTZ) – Will write automation data from the start to the end of the track/selection.

AUTOMATING SWITCHES (EG. CUTS)

As the console's **CUT** buttons have no touch sense, automation will start being written when the button is first pressed. In **Touch** mode it will return to the underlying mix pass as soon as the DAW timeline reaches the next switch change.Thus pressing and holding a **CUT** button will write data for as long as the button is held, overwriting any underlying automation. To continue to write data until you stop select **Write** or **Latch** mode.

This also applies to plug-in buttons

AUTOMATING PANS AND SENDS

As the channel D-Pots have no touch sense, automation data starts being written as soon as the control is moved. In **Touch** mode the system will stop writing automation and return to the previous level when you stop moving the control.

Your DAW may have a Touch-Timeout period which provides a time limit that allows for a certain time to continue writing automation data, after which the value of the parameter returns to the value of the underlying automation pass.

Alternatively to continue to write data until you stop select **Write** or **Latch** mode.

AUTOMATING PLUG-INS

Plug-in parameters can be automated just like other D-Pots and buttons. The only difference is that some DAW applications require the controls to armed using the on-screen menus within your DAW. Choose the automation button in the plug-in window and enable the plug-in controls to be automated.

When automating a plug-in parameter, there is no touch sense information for the D-Pot or push-push switch so in **Touch** mode data will be written for as long as the control is being moved or pressed.

Using **Write** or **Latch** mode for automating plug-ins will continue writing automation data until the DAW stops.

AUTOMATION INDICATION FOR PLUG-IN PARAMETERS

If a plug-in parameter is enabled for automation the red 'LED' below the on-screen D-Pot will flash. When writing automation data, the 'LED' will light continuously.

Refer to your DAW manual for more information on all aspects of its automation system

Finally

We are always interested to learn how many users actually read our operational manuals! If you are reading this, we would like to hear from you! If you are looking at a paper version of the manual, write your name, facility name and address in the space below and fax this page to +44 (0)1865 852212. If you have any comments to make about the manual, please fax them along with this sheet. If you are reading this from an electronic version of the manual, please email userdocs@solid-state-logic.com and include the information requested above.

Section 5A – Mackie Control (MCU) Emulation

The AWS 900+ expands available DAW control options by emulating the Mackie Control MIDI protocol as an alternative to the existing HUI protocol emulation. The new AWS software includes dedicated front panel function key mappings for Logic, Nuendo, Sonar and Digital Performer.

The Mackie Control Protocol originates from the Mackie Control Universal MIDI controller and the companion eight fader extender unit. The main control unit is functionally very similar to a HUI unit supporting 8 channel faders and associated controls, a master fader, transport controls and jog wheel, cursor keys together with dedicated function key groups for workstation control. Fader resolution is 10bit (1024 steps), identical to the HUI implementation. The Mackie Control Unit is supplied with overlay templates for different DAW packages, which label the various function key groups specifically for each supported DAW. In addition the default Logic grouping is supported by a number of workstations, which do not have dedicated overlays. These include Live, Sequoia, Final Cut Studio and Soundtrack Pro.

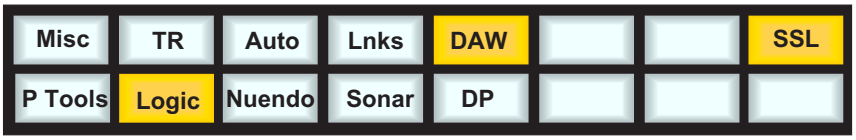
Mackie Control Emulation Advantages

- Supported by a large number of Workstation manufacturers including Apple, Sony and Steinberg.
- Plug-Ins and Virtual Instruments are controlled from the Channel D-Pots and can be flipped onto the Faders, a feature previously reserved for Pro Tools and Digidesign proprietary control surface solutions.
- Channel meters use far less MIDI bandwidth.
- 6 Character Labels for Track/Channel Names and parameter information.
- Master Fader control.

Implementation

In Mackie Control mode the AWS 900+ emulates a Mackie Control Master Console plus two Mackie Extender sections. For all supported workstations, the AWS should be configured in the relevant Control Surface set up menu, as two extenders plus a main Mackie Control unit. For the majority of DAWs the set up layout should follow the actual console surface layout with the extenders as channel 1-16 and a Mackie Control unit as channels 17-24. This ensures that any DAW master menus or messages that are shown on the channel displays are located as close to the console centre section as possible. Plug-Ins and Instruments will have their parameters assigned left justified on to the AWS channel D-Pots.

The console Master section DAW control keys map to the workstation functions according to the active control template. This is selected from the DAW menu in the SSL Option Menu.



Initially four dedicated DAW templates are supported, Logic, Nuendo (also used for Cubase), Sonar and Digital Performer. The Logic template can also be used as a generic interface for Live, Final Cut Pro and other software that supports the standard Mackie Control surface function key grouping. The AWS 900+ includes the additional key caps to support the four function templates. Existing 900 users will need to order the key cap set from their local SSL distributor

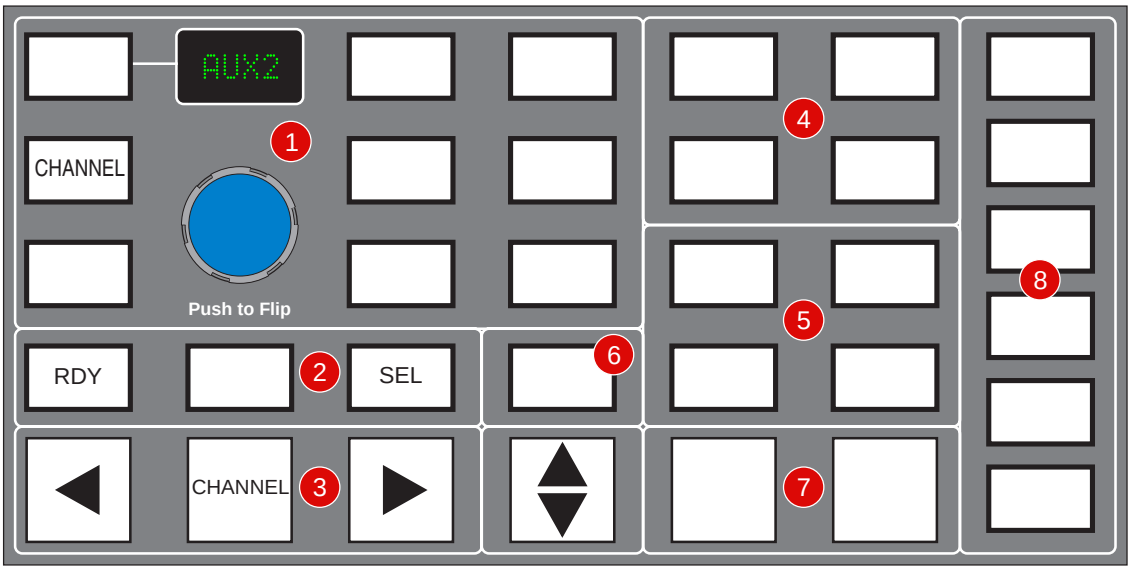
The majority of DAW functions are controlled via dedicated AWS front panel switches with less reliance on the 8x8 soft key matrix located beneath the TFT screen than with the HUI protocol. All Plug-In editing is via the channel D-Pots. The four encoders together with the six switches below the centre section monitor screen, are not used with the Mackie Control protocol. On the channel fader strips, the Auto key and associated status LEDs are also not implemented by the protocol. All other controls, the D-Pot and associated encoder switch, DAW channel Solo and Cut plus the Select and Ready functions, are fully supported. Only mono metering information is returned from the workstation. On stereo channels the maximum value of the left or right channel is displayed. The master fader is also included in the DAW layer when a Mackie Control template is active.

The ten keys located above master transport keys provide different related motion control functions according to the active template. When required tallies for these keys will be displayed on the TFT display in the area next to the DAW timeline counter.

The Jog Wheel together with the Scrub function key, and the Cursor keys and Cursor mode switch are active in all templates. The outer Jog Wheel is not supported, neither is the numeric keypad. However the 1-8 keys replicate F1 - F8 Function keys in certain templates.

DAW Control Function Key Overview

As far as possible all function key templates use key groupings and layouts which follow the original Mackie Control surface groupings to simplify moving from one DAW platform to another.



1. Channel D-Pot Functions and Display options. The Encoder switch flips D-Pot Parameters on to the channel faders. The encoder itself is not used in any of the Mackie Control templates. CHANNEL has the same functions as in the HUI Mode and assigns either the Console or DAW channel level control to the D-POT according to the state of the Master Console Focus control.

2. As with the HUI protocol, the RDY and SEL keys determine the function of the Channel strip SEL key. Default is the SEL(ECT) function, RDY accesses DAW track arming from the channel strip via the SEL key. The centre key is used as a discrete function key in some of the templates and corresponds to the EDIT/GLOBAL key located next to the FLIP key on a Mackie Control Unit.

3. Channel and Control surface banking – identical to the HUI Mode.

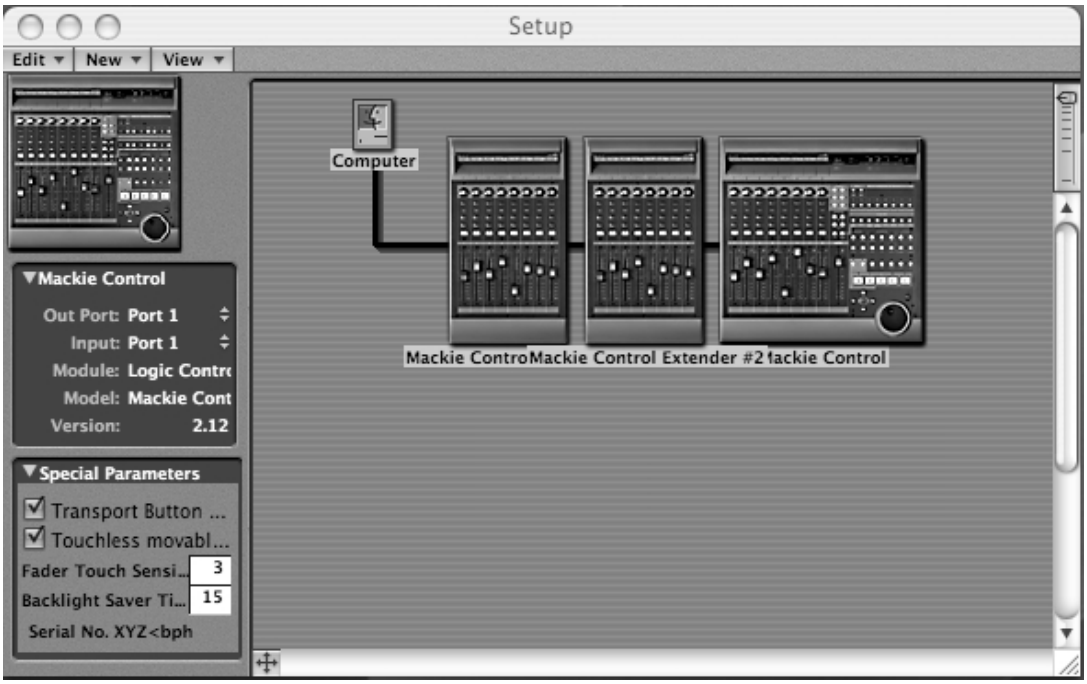
4. Project/Menu Keys – Similar style functions to HUI mode but template specific.

5. Modifier keys – Layout and Name template specific.

6 7 8 Dedicated Function(s) – Template specific.

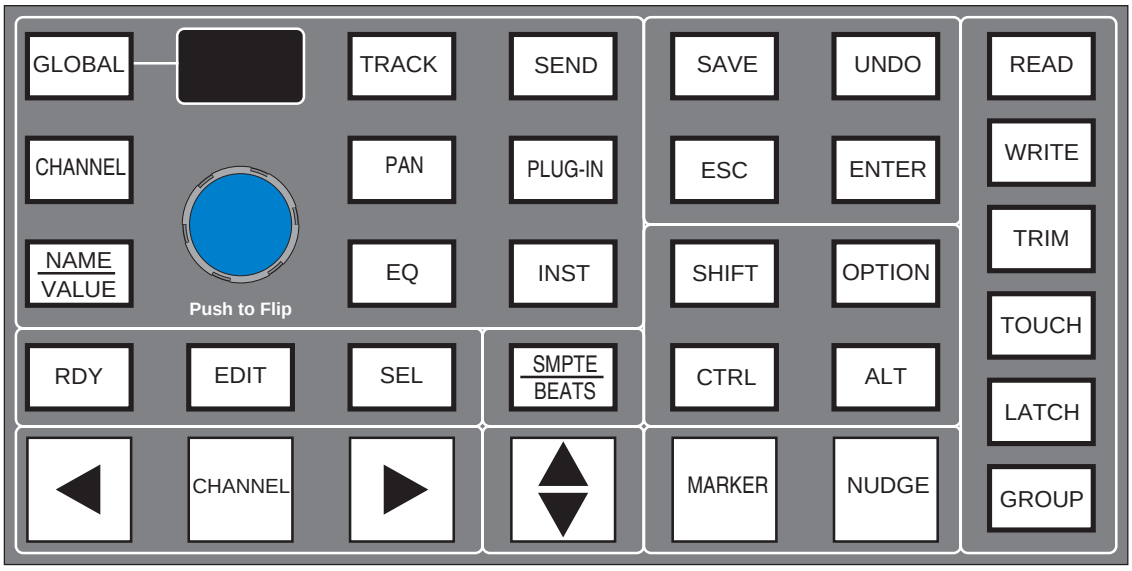
The Logic Template

The AWS emulates a Mackie Control plus two Mackie XT fader expanders. The Logic Control Surface set up should be configured as shown below in the Logic Preferences menu



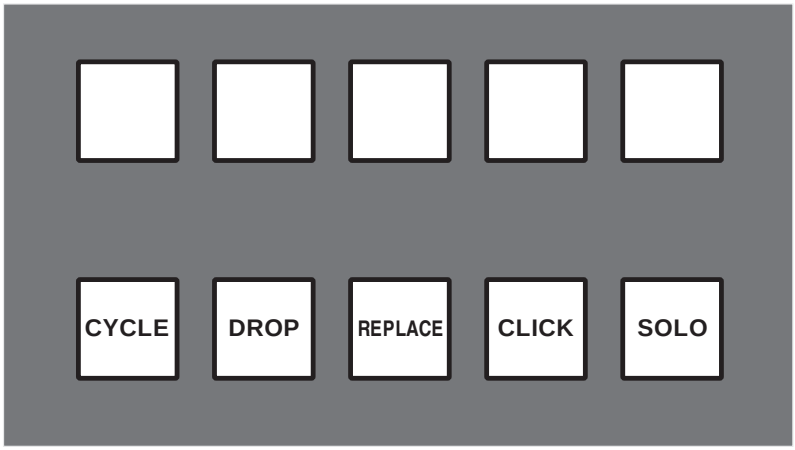
This layout ensures that when the channel V-Pots are used to select master functions, they will be located next to the AWS physical master section not at the far end of the console.

AWS Logic Control Key Layout



Major changes compared to the HUI front panel are Automation modes replacing the Screen display select keys and the inclusion of the MARKER and NUDGE functions. GLOBAL uses the 8x8 matrix keys to select the different view options. CHANNEL is unchanged and assigns the AWS channel gain element to the D-Pot. The Encoder switch is used to 'flip' parameters on to the fader but the encoder itself has no function. The Display indicates D-Pot mode with a two-character label. Plug Ins are controlled from the channel D-Pots so there is no longer an 'EDIT' select mode for the channel SEL key.

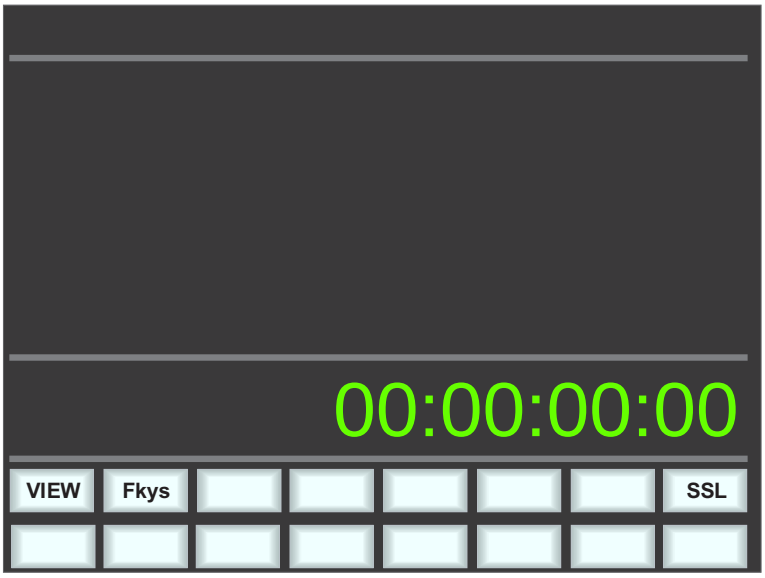
AWS Transport Function Key Layout



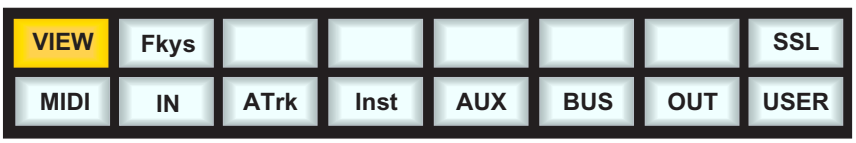
Only five of the ten keys above the Motion controls are assigned. These have on screen tallies in the status area of the TFT display.

Full operational documentation for using Logic with Mackie Control and Extender units can be found in Logic Pro 7.1 Dedicate Control Surface Support (Manual) which can be downloaded from http://www.apple.com/support/manuals/logicpro/.

The AWS Logic Control screen



VIEW is selected automatically by the GLOBAL key to access the eight Global View select keys. It can also be selected manually if required. There are no tallies for the selected VIEW. VIEW is an AWS function and not part of the MCU protocol.



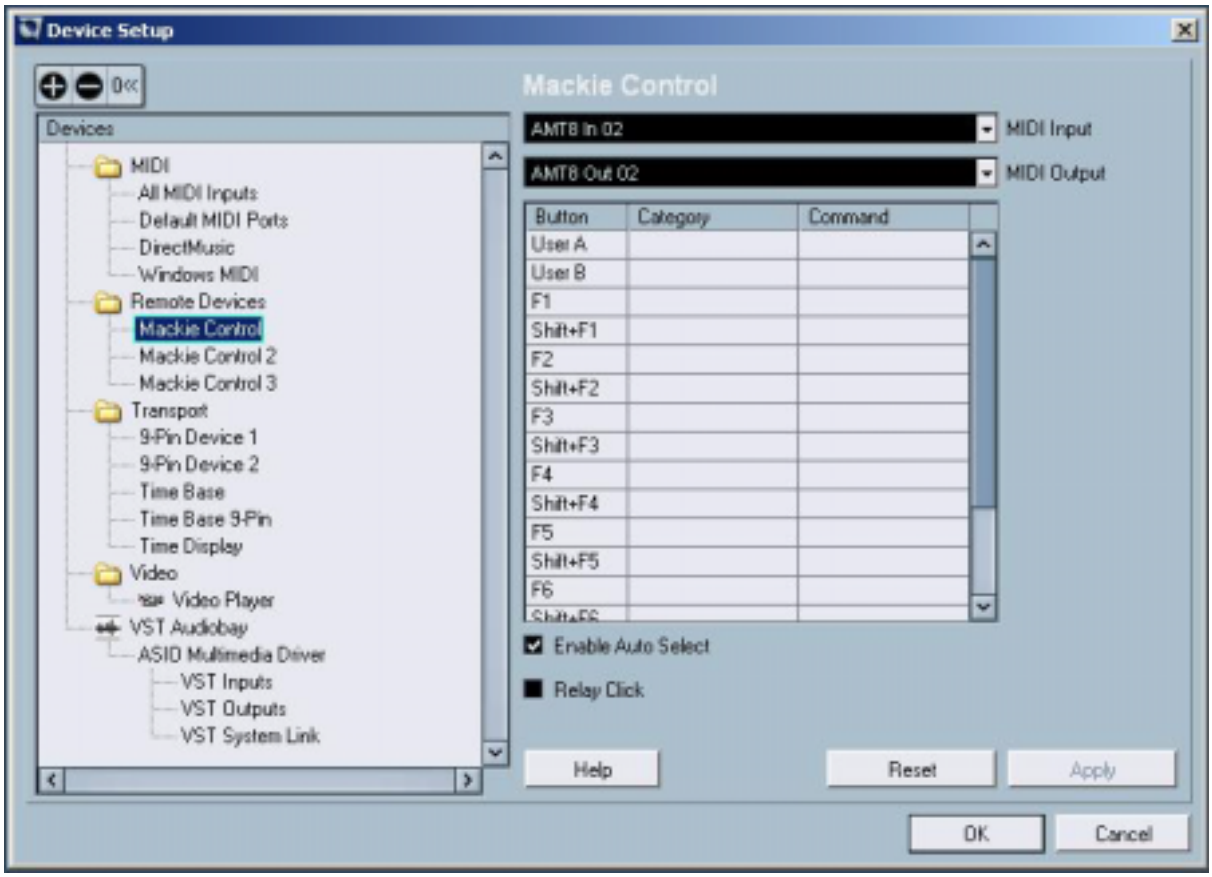
Fkys are the eight functions keys as on the HUI interface. These are also permanently mapped to the numeric keypad, which is not supported in the Mackie Control protocol.

A ‘ Rude’ Solo tally is displayed in the on-screen Status area. This corresponds to the front panel LED on a MCU.

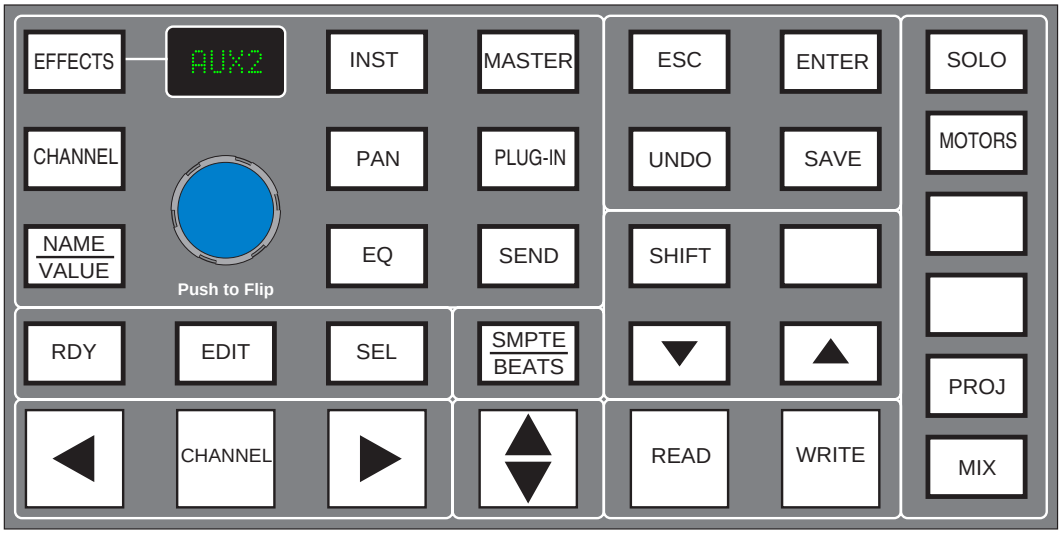
Standard Mackie Control Front Panel Layout

Nuendo/Cubase Template

As with the other templates the AWS emulates a Mackie Control Main unit plus two Mackie Control Extenders. MIDI Control surface assignment is set up in the Remote Device list. Nuendo does not have separate profiles for the Mackie Extender, so three Mackie Control units are entered in to the device list with the top most unit corresponding to AWS channels 17 – 24 and the other units mapped to the remaining channels in descending order.



AWS Nuendo Control Key Layout



The majority of Nuendo or Cubase functions are controlled via dedicated keys with virtually no reliance on the 8x8 key matrix located beneath the screen. Full details are available in the Mackie Control and Nuendo document available from the Nuendo download page http://www.steinberg.de/439_0.html.

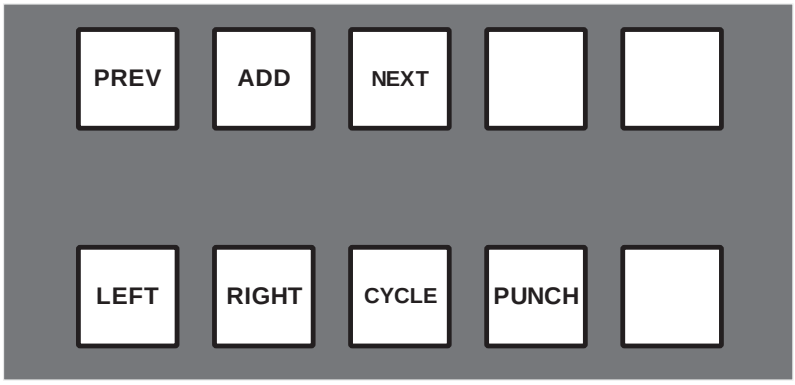
Major changes compared to the HUI front panel are the new control set for assigning processing parameters to the D-Pots.

Up and down page keys for D-Pot parameters are located with the Shift key block. The rotary encoder will also output the page up/down commands when turned left or right.

RDY and **SEL** control the function of the Channel **SEL** key as in the HUI interface. The **EDIT** key is used to open editing windows in Nuendo or Cubase for the current selection. **EDIT** together with **SHIFT** will close an active window.

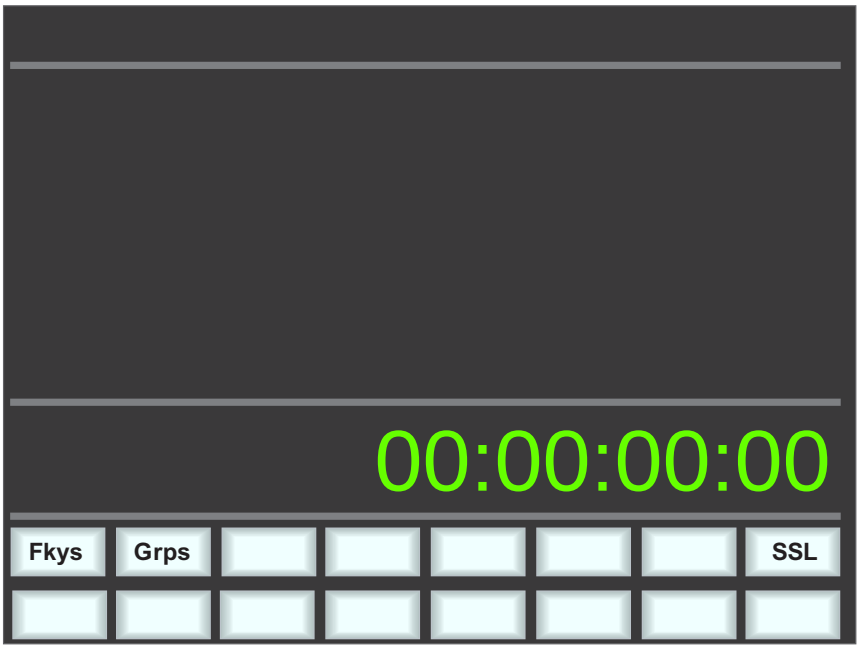
CHANNEL is unchanged and assigns the AWS channel gain element or DAW channel to the D-Pot according to the state of the Console Focus key. The Encoder switch is used to 'flip' parameters on to the faders as before but now includes all processing parameters not just send levels.

The Keys above the Motion controls are assigned to related transport functions as on the HUI interface.



The Cycle and Punch tallies are displayed in the status area of the TFT display.

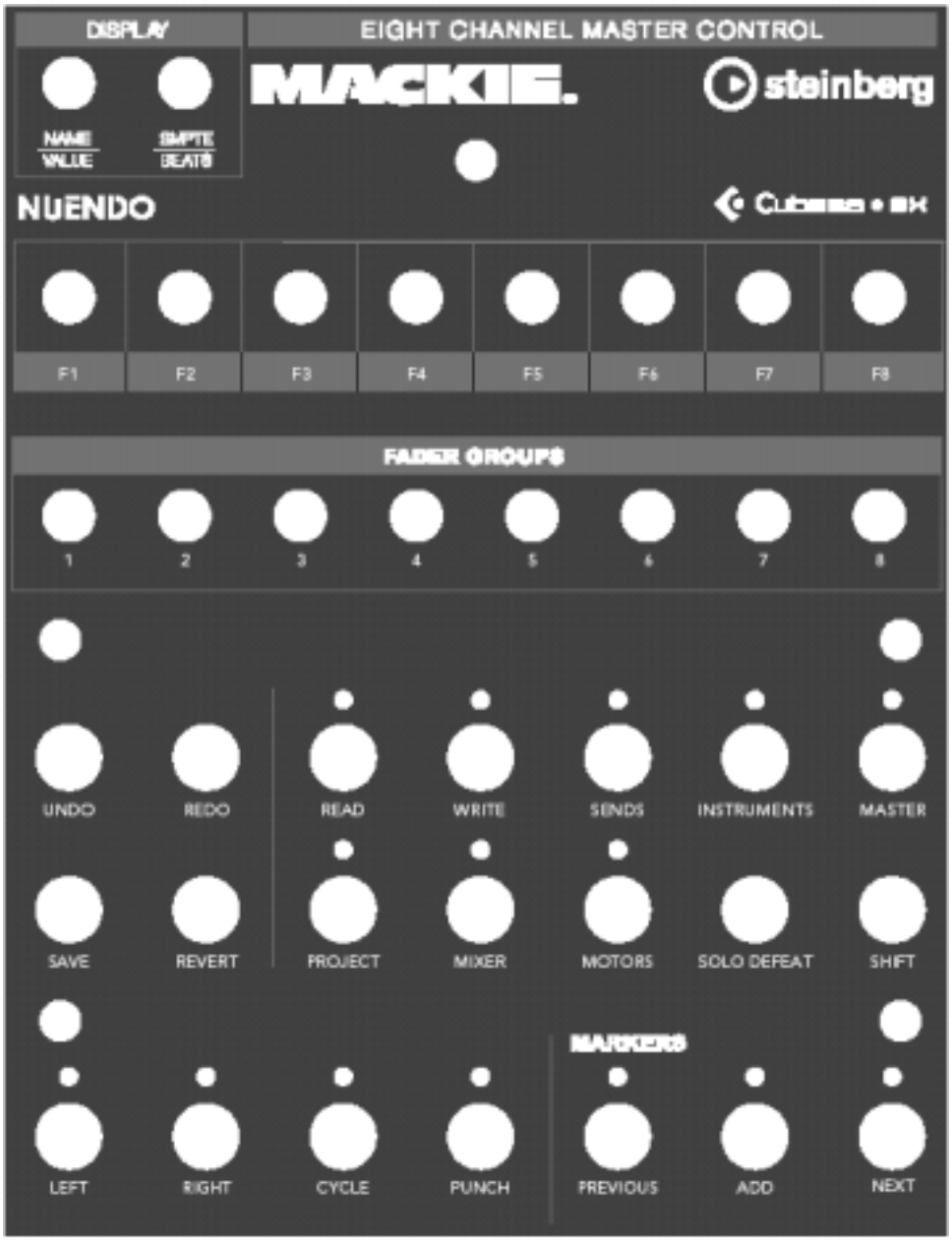
The AWS Nuendo Control screen



Fkeys are the eight functions keys. These are also mapped to the numeric keypad, which is not supported in Logic Control.

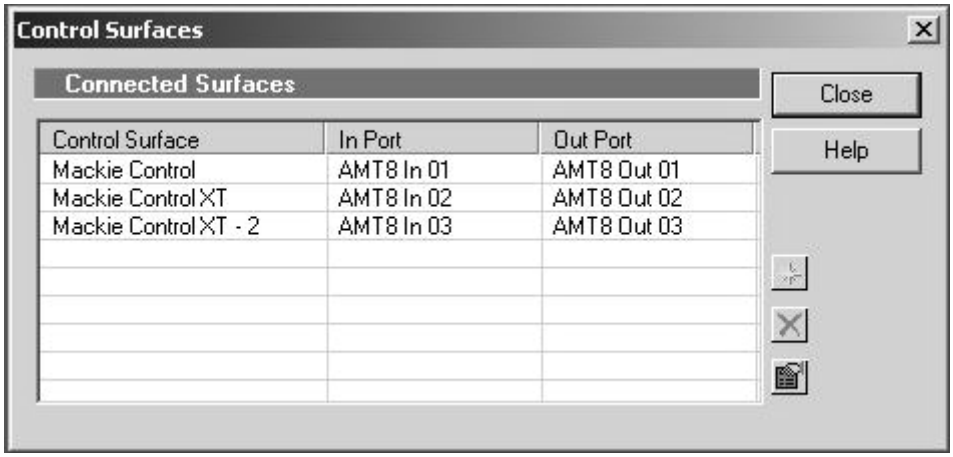
Grps are the eight Fader Group keys.

Mackie Control Surface Steinberg Overlay



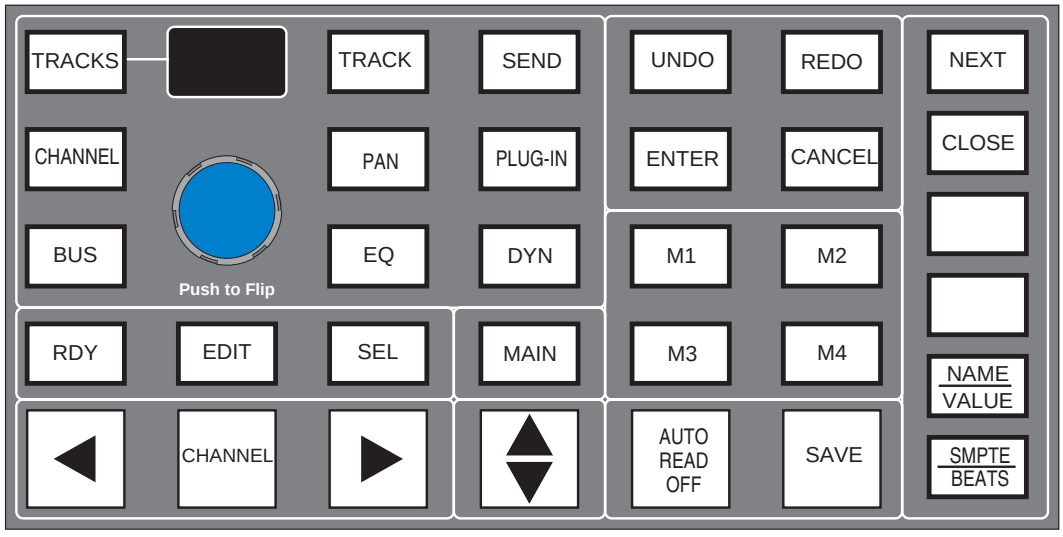
The Sonar Template

The AWS emulates a Mackie Control (MCU) plus two Logic XT fader expanders. The Control Surface set up menu is located in the Sonar Options Menu.



To set up the correct mapping of AWS faders to DAW channels, select Mackie Control from the Tools menu to access the Properties page and the Configure Layout option. Full on-line operational documentation for the Mackie Control and Expander (XT) functions can be accessed via the PC keyboard F1 key when the Control Surface Properties dialogue is open.

AWS Sonar Control Key Layout



The majority of functions are controlled via dedicated keys with less reliance on the 8x8 key matrix located beneath the screen than with the HUI version.

Main changes compared to the HUI front panel are:

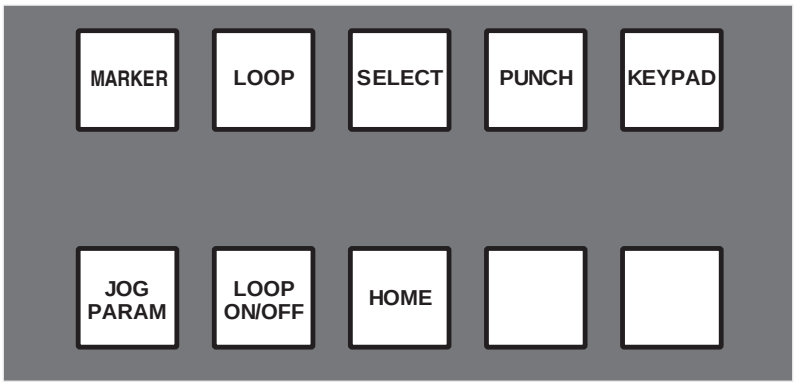
New Function grouping to assign parameters the Channel D-Pots. CHANNEL is unchanged and assigns the AWS channel gain element or DAW channel to the D-Pot according to the state of the Console Focus key. The Encoder switch is used to 'flip' parameters on to the faders as before but now includes all processing parameters not just send levels. Two 'Flip' modes are available, Duplicate or Exchange, selected via a single or double operation of the encoder switch.

As in the original HUI three key group that controls the function of the channel SEL key, for the Sonar Template SEL and RDY control whether the SEL key sends the SEL and REC/RDY MIDI codes. EDIT is now a dedicated function equivalent to the MCU EDIT/GLOBAL function located in the FADER BANKS section.

The display above the encoder will show the two character plus decimal point Assignment window from the MCU.

CHANNEL is unchanged and assigns the AWS channel gain element or DAW channel to the D-Pot according to the state of the Console Focus key. The Encoder switch is used to 'flip' parameters on to the faders as before but now includes all processing parameters not just send levels.

The Keys above the transport controls are designated as shown below:

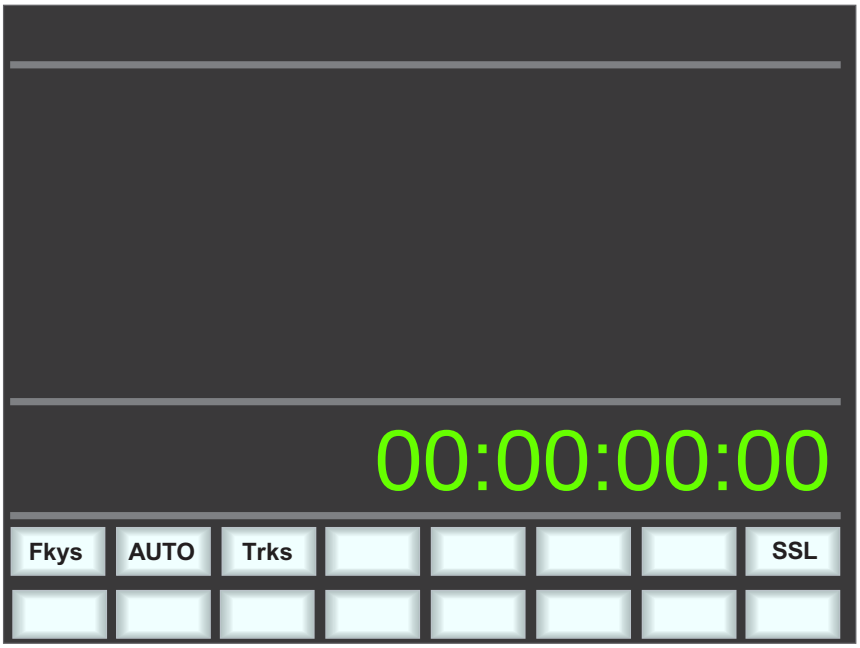


Tallies are shown in the status area of the TFT display for Loop ON/OFF, Jog Parameter, together with tallies for Marker, Loop, Select and Punch. As the later functions intercancel, they share the same on screen area.

Keypad is not a direct MCU function. It will enable the Numerical keypad 0 …. 9 keys plus the '.', '-', and ENTER and CLR keys for data entry. When operated it send the codes that correspond to M1 ON, EDIT ON, EDIT OFF, M1 OFF and then enables the numeric key pad keys to send the MIDI codes that correspond to the 1 to 8 keys on the Sonar overlay and the 4 TRACKS keys. ENTER mimics the main ENTER Key, and CLR the CANCEL Key. A second operation of the KEYPAD key inhibits the Numeric key pad outputting MIDI codes and should send an EDIT ON, EDIT OFF command to cancel the mode.

The AWS Sonar Control screen

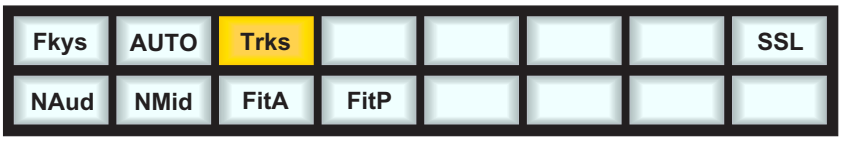
The 8x8 key matrix is used to access three Sonar MCU function groups.



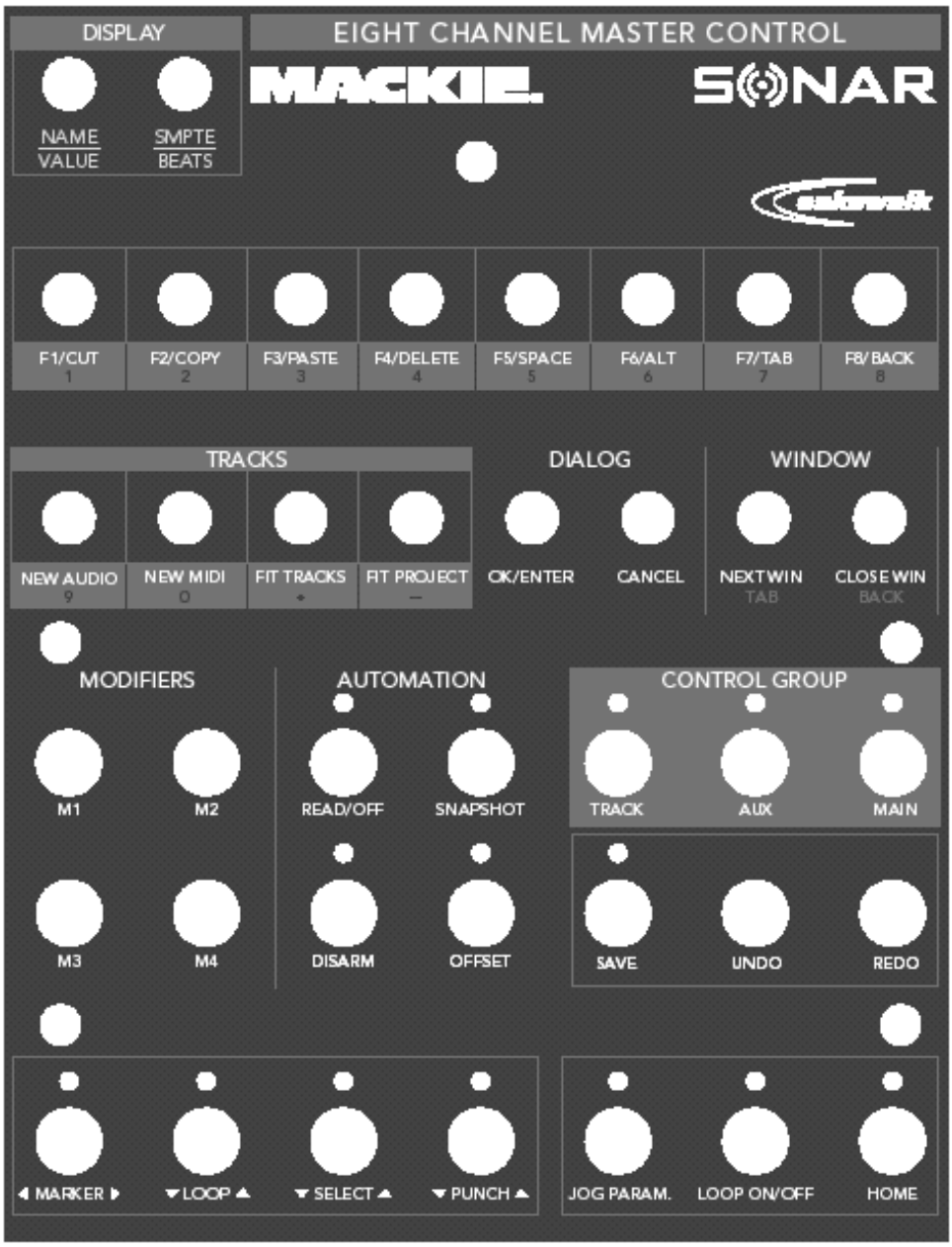
Fkys are the eight functions keys. These are defined in Sonar and also output Edit commands in conjunction with a Modifier key.

Auto calls up three Automation functions, Snapshot, Disarm and Offset. The main automation Read/Off key is mapped to a dedicated front panel switch.

Trks bring the four TRACKS function keys on to the bottom row of soft keys.

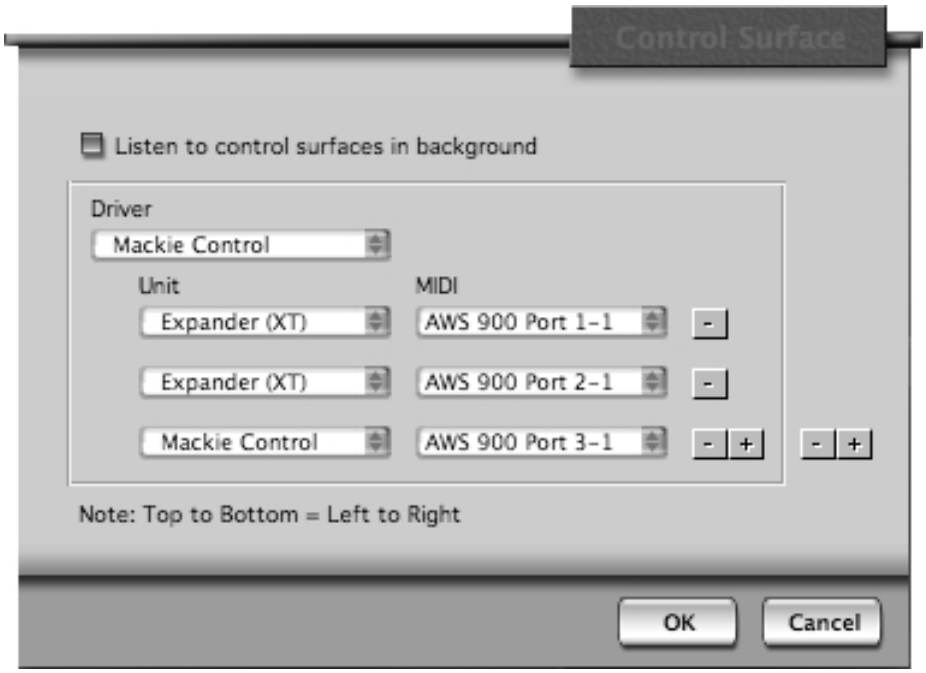


Mackie Control Surface Sonar Overlay



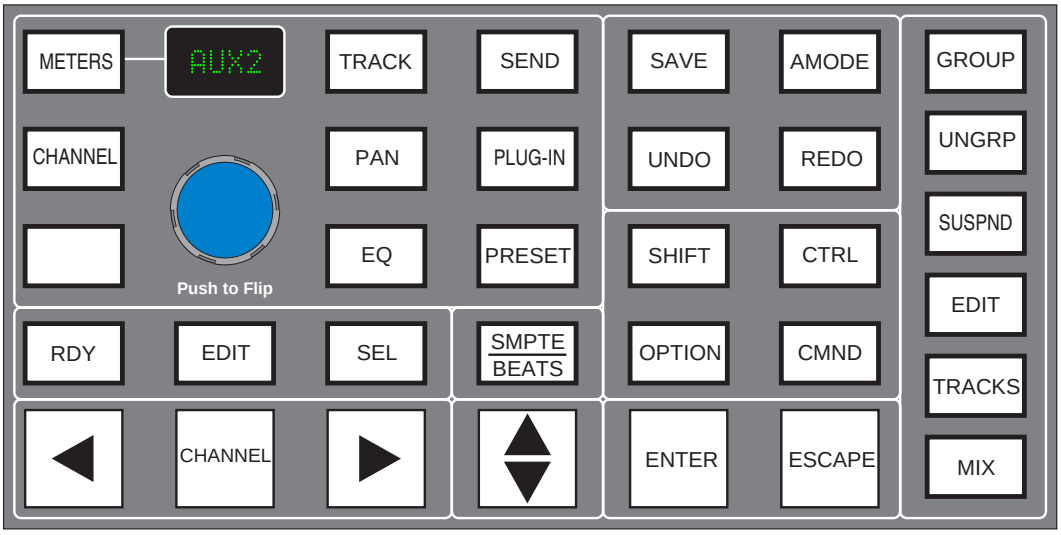
Digital Performer Template

The AWS emulates a Mackie Control Unit plus two Mackie Control Expanders. The Control Surface set up menu is located in the Digital Performer Setup Menu.



Assign the AWS MIDI ports so that the console faders map correctly to the DAW tracks with the Mackie Control Unit as channels 17-24.

AWS Digital Performer Control Key Layout

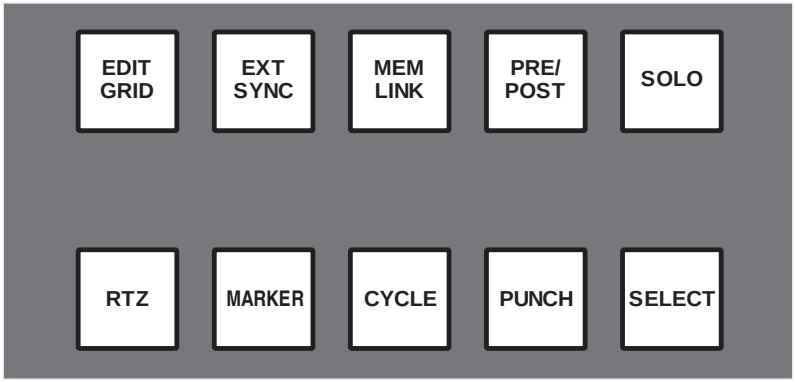


The majority of functions are controlled via dedicated keys with less reliance on the 8x8 key matrix located beneath the screen than the HUI interface.

Main changes compared to the HUI front panel are:

New Function grouping to assign parameters the Channel D-Pots. CHANNEL is unchanged and assigns the AWS channel gain element or DAW channel to the D-Pot according to the state of the Console Focus key. The Encoder switch is used to 'flip' parameters on to the faders as before but now includes all processing parameters not just send levels. The EDIT key is the standard MCU Edit (or Global View) command key, it does not affect the operation of the channel SEL keys which can be flipped between the Ready(RDY) and Select(SEL) functions as per the HUI mapping.

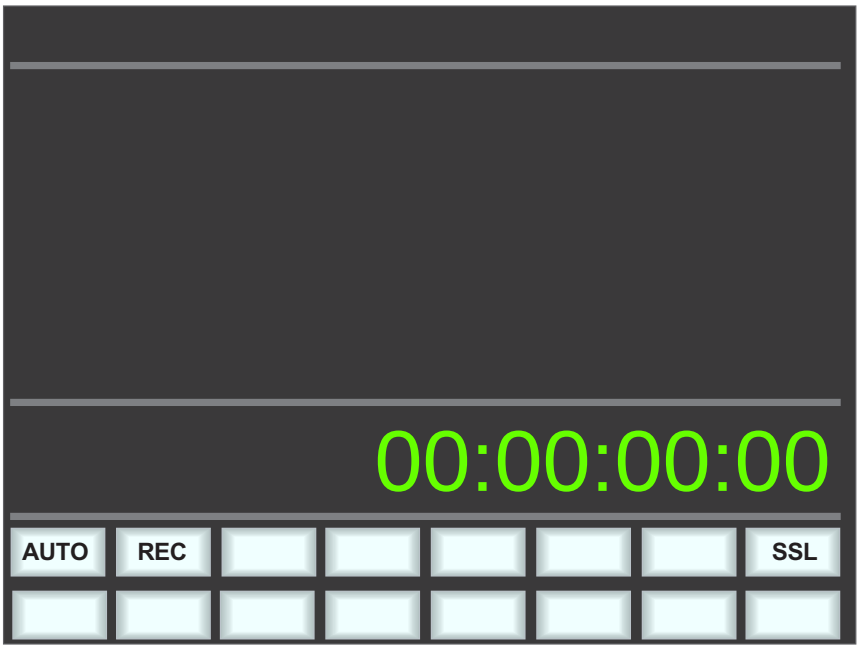
The Keys above the Motion controls are assigned to related transport functions as on the HUI interface.



On screen tallies are provided for the Marker Key, together with a second tally for the MCU 'Rude Solo' indicator.

THE AWS DIGITAL PERFORMER CONTROL SCREEN

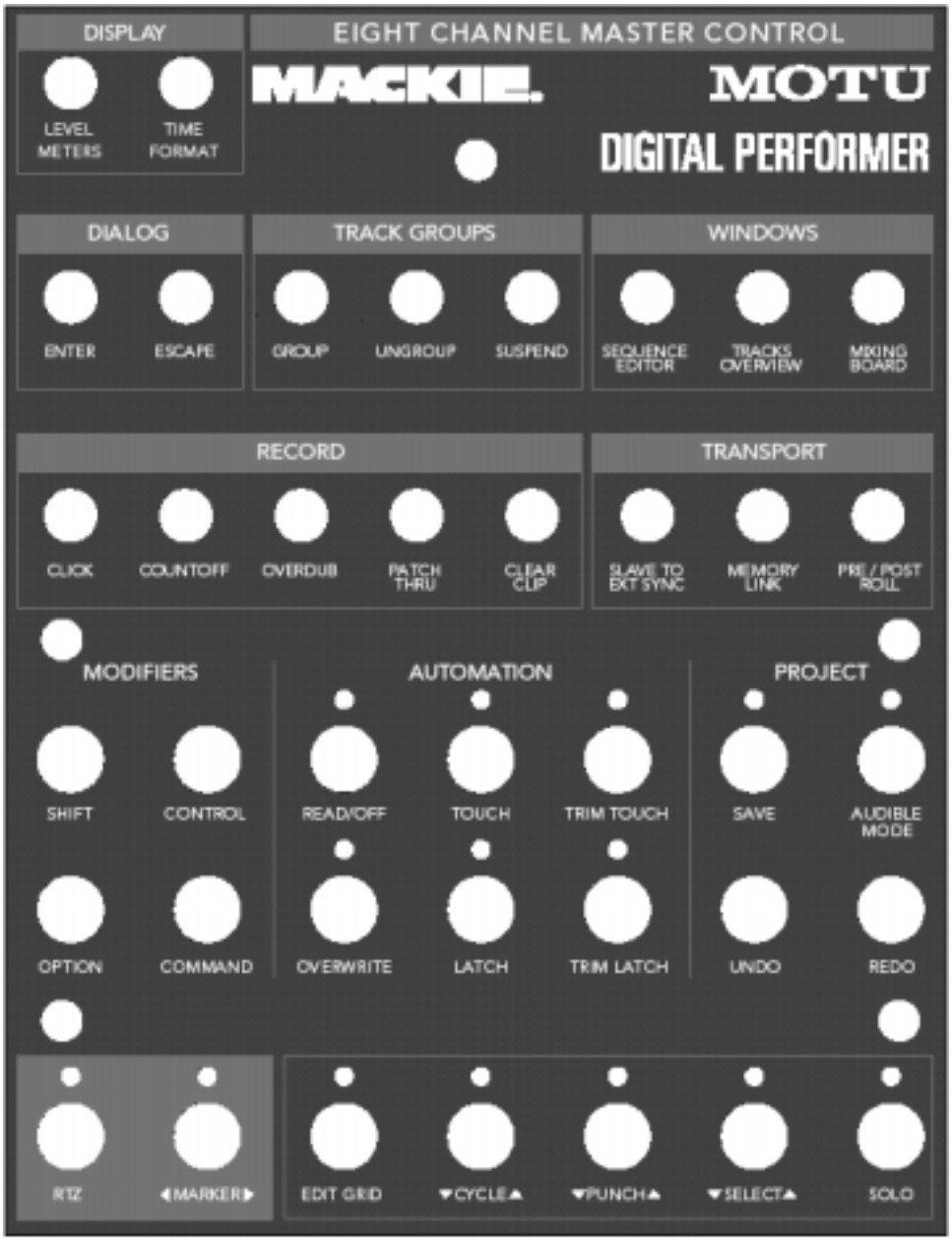
Two sets of menu keys are accessed via the 8x8 soft key matrix.



AUTO calls up the six Automation modes.

REC are the Record set-up functions.

Mackie Control Surface Digital Performer Overlay



Section 6 – Total Recall

Overview

The AWS 900+ Total Recall package is a chargeable option for the AWS 900+ console. Consoles that have the option installed will display a 'TR' logo in the top corner of the TFT screen. Information on purchasing and installing Total Recall can be found later in this chapter.

The system uses the inboard TFT screen to give a graphical display of current and stored control settings of all rotary controls, faders and switches on the AWS 900+ channel and centre section modules. Controls that are in different positions from the stored values are highlighted in white (faders and rotary controls) or yellow (switches). To provide maximum clarity rotary controls are shown as horizontal sliders and switches as boxes. Electronically latched switches such as routing, EQ, Insert, Dynamics and Cut switches can be reset to match the stored setup by pressing the fader status switch twice.

Stored setups can be copied or swapped between channels by holding down the fader status switch on the source channel then pressing the fader status switch on the destination channel. If the COPY switch is selected the source channel settings are copied to the destination channel: if not the source and destination channel settings are swapped. See page 6-4.

Up to 32 different TR setups can be stored in local memory on the AWS 900+. An unlimited number can be saved as a System Exclusive dump to a sequencer, MIDI librarian or workstation and loaded back to the AWS 900+ by playing through the SysEx track. See page 6-3 for more details.

Installation

A Total Recall activated version of the current software must be downloaded from the SSL website to a Mac or PC that is connected to the AWS 900+ MIDI port. To activate Total Recall you will need to have purchased a Total Recall activation code from your distributor. You will also need the serial number of your console which can be found on the silver label on the rear of the console, adjacent to the mains connector.

Page 6-6 details the download and installation process.

Once Total Recall has been activated for a particular console all future downloads will automatically include the Total Recall software. Activated software will run on any AWS 900+ consoles but Total Recall will only be available on the console the software was originally downloaded for.

Total Recall data can be transferred to and from a PC or Mac using MIDI port 4 on the AWS 900+. This must be connected to a spare MIDI port on your MIDI interface and added to your MIDI setup before you can save or load Total Recall.

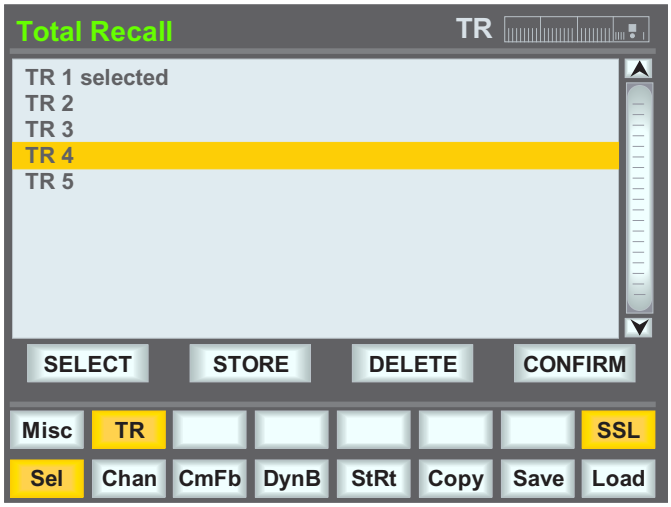
Operation

Accessing Total Recall

Total Recall is accessed using the soft keys on the Master Control Panel in the centre section. Refer to page 5-22 for an explanation of the use of soft keys if you are not familiar with this section of the console.

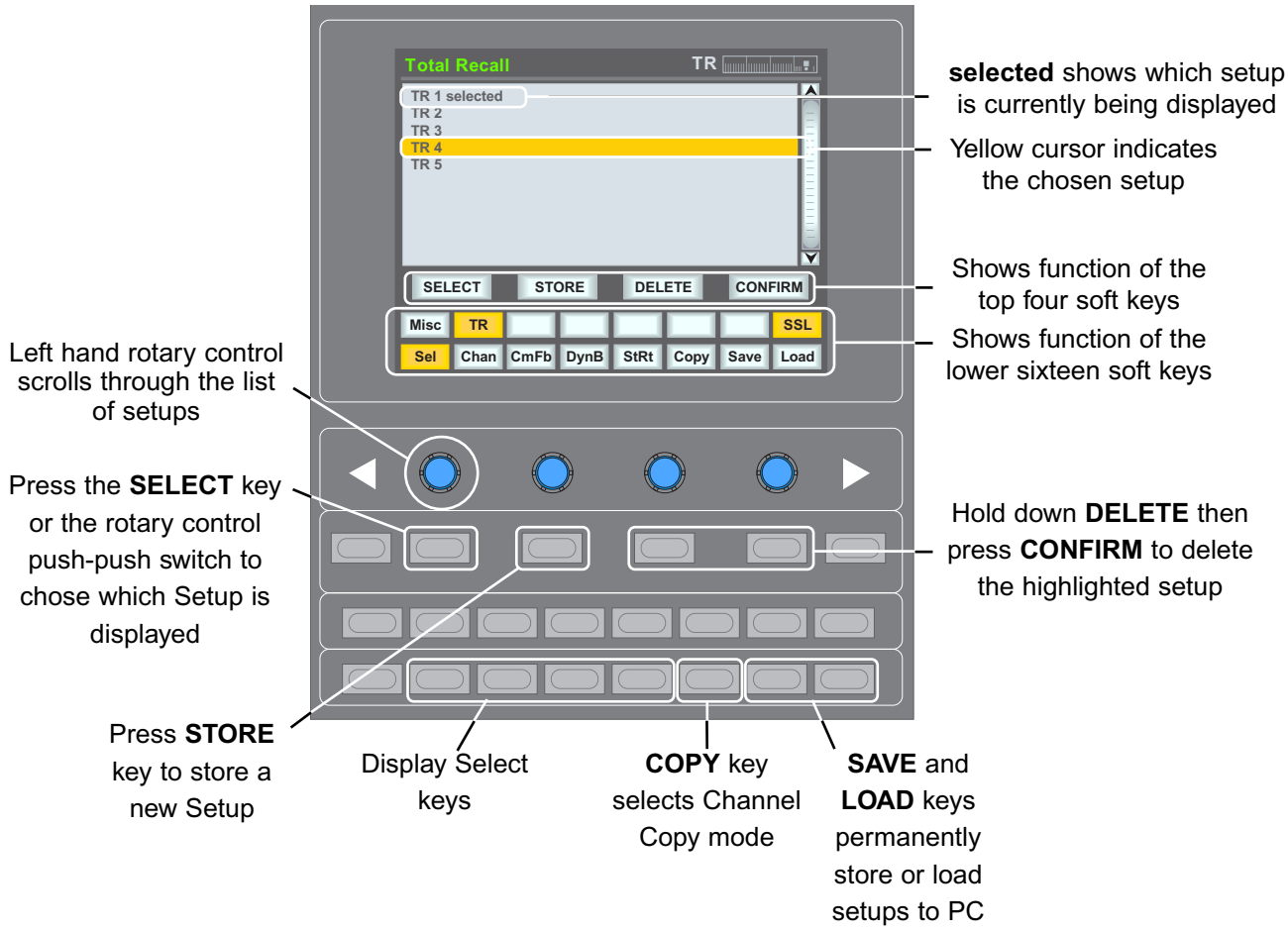
Use the soft keys to select **SSL** then **TR** to access the main Total Recall menu.

The bottom row of soft keys will now show a range of options.



SEL menu

The **SEL** menu is the main file menu for the Total Recall system. The main window shows a list of stored setups. The setup which is being displayed has the word **'selected'** next to it.



Storing setups

Setups can be stored at any time using the **STORE** soft key. This saves the current desk setup to local memory.

If the desk is turned off these settings will be lost. TR setups must be saved to a sequencer or DAW MIDI track for permanent storage.

New setups are numbered starting at '1'. If a setup is deleted (see below) then its number will not be re-used. The only exception to this is if all setups are deleted. The numbering will then restart from '1'.

Changing the selected setup

The left hand rotary control can be used to scroll through the list of TR setups. A yellow cursor indicates which setup is currently chosen to be modified. Either the **SELECT** soft key or the rotary encoder's push-push switch can be used to select the highlighted setup for display. The '**selected'** message will appear next to the setup to indicate that it is being displayed.

Deleting Setups

Setups can be deleted from memory by highlighting the setup up you wish to delete, holding down the **DELETE** soft key and pressing the **CONFIRM** soft key.

Saving Setups to a Mac or PC

All the stored setups can be saved as a System Exclusive dump to any software package that supports MIDI SysEx dumps. In practice this includes most packages and you would normally save the TR setups to an additional track in your current DAW project so that your setups are stored with the rest of the project.

To save TR setups to Mac or PC do the following:

- Create an additional MIDI track in your DAW program.
- Select its input and output to be AWS MIDI port 4.
- If available select the track to store System Exclusive data.
- Record enable the MIDI track.
- Press **Play** and **Record** on the AWS 900+ motion control panel to put the MIDI track into record.
- Press the **Save** soft key to start transmission of all saved Total Recall setups. The on-screen **Save** box will remain yellow until all data has been transmitted.
- Once the **Save** box has turned grey press **Stop** to end recording.

Note that it takes approximately 3 seconds to transmit each Total Recall setup.
An unlimited number of Total Recall setups can be stored in this way.

Loading Setups from a Mac or PC

Restoring setups from a Mac or PC is even simpler:

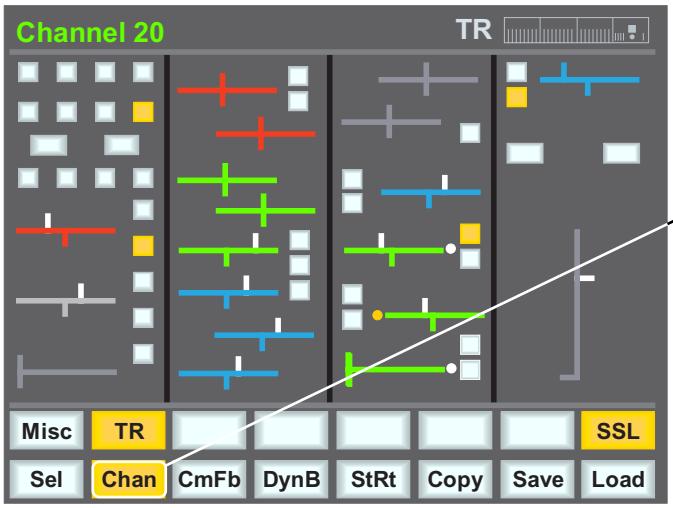
- Locate the DAW to just before the SysEx data containing the setups you wish to load.
- Press the **Load** soft key.
- Play through the SysEx block of data. As soon as the AWS 900+ detects the start of valid data it will delete all the current setups and replace them with the stored ones from the MIDI track.

Because the Load process replaces your current setups with the ones stored on your Mac or PC you should check you have saved any setups you wish to keep before loading new ones.

Total Recall Display pages

There are four Total Recall display pages. These are selected using soft keys as described below. In all cases controls that are in different positions from the stored values are highlighted in white (faders and rotary controls) or yellow (switches). To provide maximum clarity rotary controls are shown as horizontal sliders and switches as boxes.

The Channel Display



Chan selects the channel display. Pressing the fader status switch will select a channel to be displayed. The console must be in Analogue Focus mode (Focus key illuminated).

Setting soft switches

A double press on the fader status switch will reset all the non-latching switches in the channel strip. These are:

- Track bus routing switches
- Dynamics assignment and routing switches
- Mic/line selection
- EQ and Insert IN switches
- Aux on/off and EFX reassign switches
- REC and MIX bus assignment
- Fader position

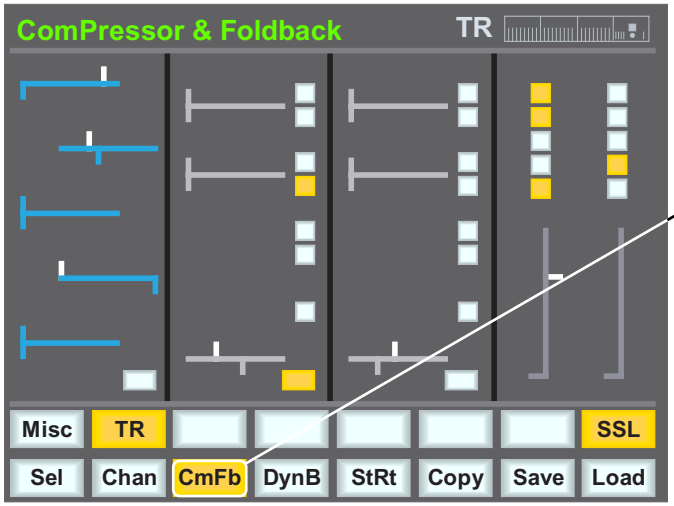
All latching switches must be reset manually.

Copying and Swapping setting between channels

Stored setups can be copied or swapped between channels by holding down the fader status switch on the source channel then pressing the fader status switch on the destination channel. If the **COPY** soft key is selected the source channel settings are copied to the destination channel: if not, the source and destination channel settings are swapped.

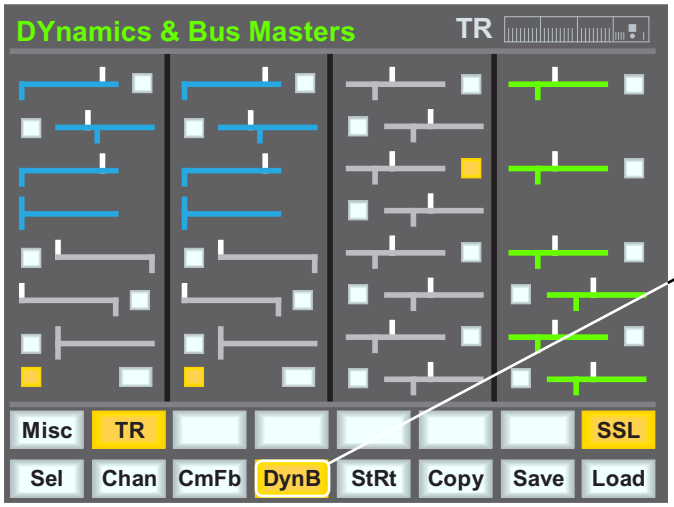
Centre section displays

Compressor and Foldback



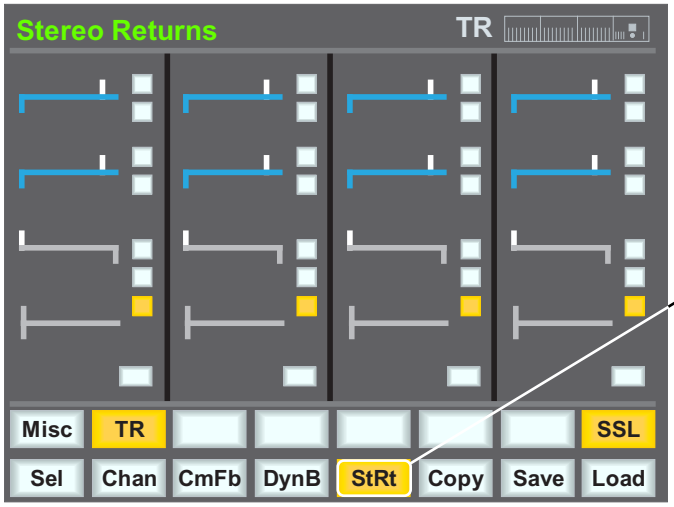
Pressing **CmFb** or pressing the master fader status switch will display the centre section compressor, the master fader and foldback sections.
A double press on the fader status switch will reset the REC and MIX fader positions and the REC and MIX processing switches.

Dynamics and Bus Masters



DynB displays the mono dynamics sections and the track and bus masters.

Stereo Returns



StRt displays the four stereo echo returns.

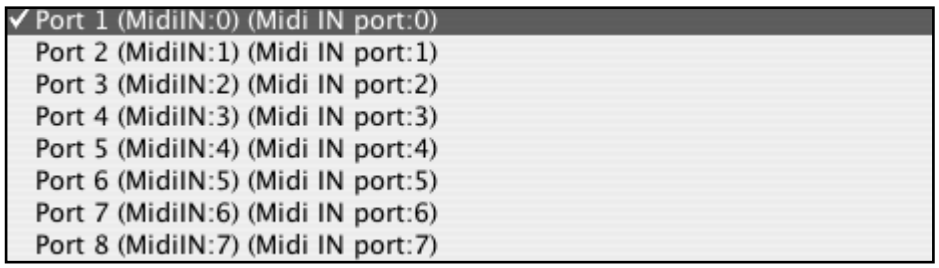
Software Download and installation

A Total Recall activated version of the current software must be downloaded from the SSL website to a Mac or PC that is connected to the AWS 900+ via MIDI. To download Total Recall enabled software, please go to http://www.solid-state-logic.com/update. This page will present you with the three stages required for downloading your new software:

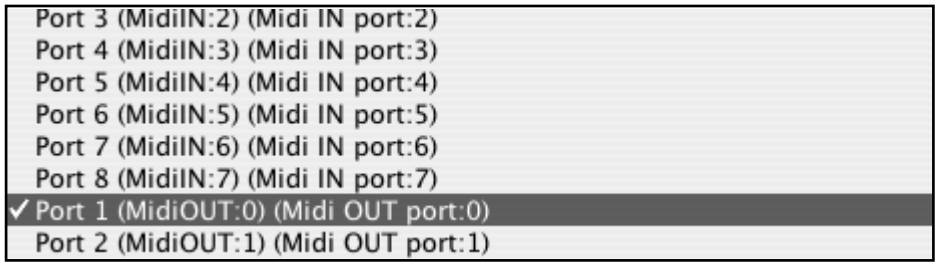
1. Register. You will need to be registered with us to access the software activation and download pages.
2. Activate. The software that is to be downloaded must be activated first. Activation will require the following information; a. Your email address, b. Your console serial number (which can be found on the silver label on the rear of the console, adjacent to the mains connector) and c. Your Total Recall activation code – purchased from your distributer.
3. Download. The download page will carry a link to your (activated) Total Recall software.

The software is packaged as a 1.1MB (approximately) Java archive file, the format of which is compatible with both PC and Macintosh (OSX only) platforms. Note that once Total Recall has been activated for a particular console, all future downloads will automatically include the Total Recall software. Activated software will run on any AWS 900+ console but Total Recall will only be available on the console for which the software was purchased. Some users may need to install additional files on their DAW computer before continuing – see **System Requirements** opposite. Once the software update file has been downloaded to your DAW computer you are ready to install the new software. The following steps detail this process:

1. Ensure that AWS is booted and connected to the MIDI port on your DAW.
2. Close all current applications on your DAW.
3. Double click on the AWS Software Update File. You should see the SSL AWS Software Update window appear.
4. Go to the **In MIDI Port** menu. Select the MIDI IN port which is connected to MIDI port 1 on your AWS 900+ from the drop down list. In the example shown below this was port 1 on an 8 port interface. If nothing appears in the list check that you have installed the files listed in the System Requirements section on the opposite page.

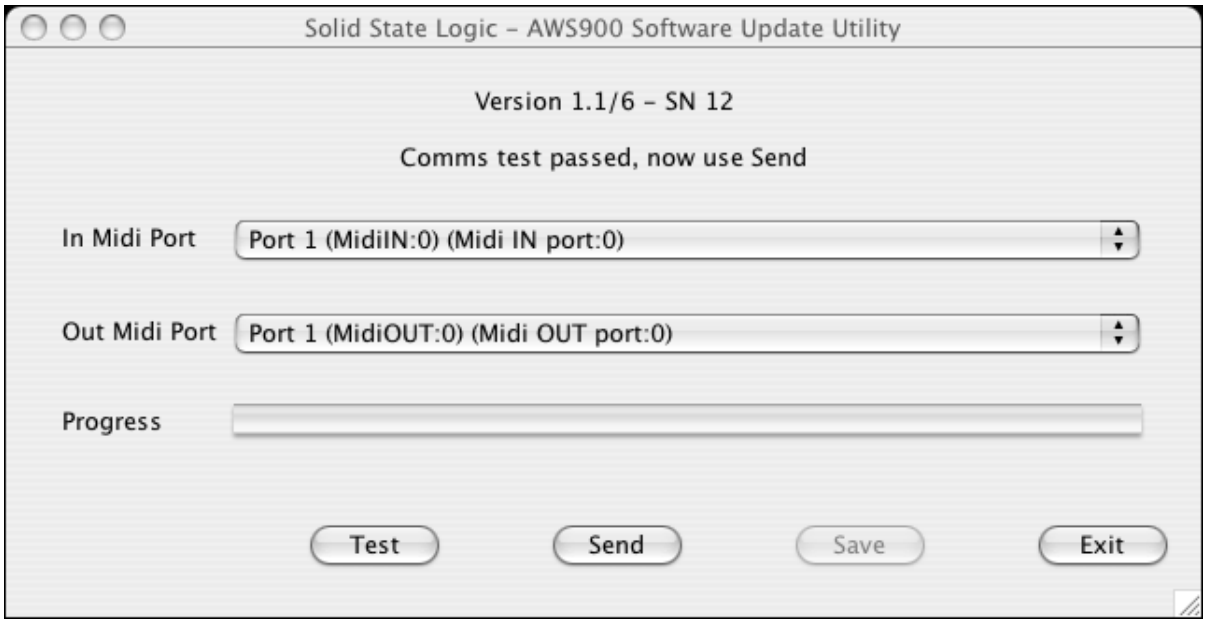

✓ Port 1 (MidiIN:0) (Midi IN port:0)
Port 2 (MidiIN:1) (Midi IN port:1)
Port 3 (MidiIN:2) (Midi IN port:2)
Port 4 (MidiIN:3) (Midi IN port:3)
Port 5 (MidiIN:4) (Midi IN port:4)
Port 6 (MidiIN:5) (Midi IN port:5)
Port 7 (MidiIN:6) (Midi IN port:6)
Port 8 (MidiIN:7) (Midi IN port:7)

5. Go to the **Out MIDI Port** menu. Select the MIDI IN port which is connected to MIDI port 1 on your AWS 900+ from the drop down list. Select the MIDI OUT port which is connected to MIDI port 1 on your AWS 900+.


Port 3 (MidiIN:2) (Midi IN port:2)
Port 4 (MidiIN:3) (Midi IN port:3)
Port 5 (MidiIN:4) (Midi IN port:4)
Port 6 (MidiIN:5) (Midi IN port:5)
Port 7 (MidiIN:6) (Midi IN port:6)
Port 8 (MidiIN:7) (Midi IN port:7)
✓ Port 1 (MidiOUT:0) (Midi OUT port:0)
Port 2 (MidiOUT:1) (Midi OUT port:1)

Note that the Macintosh will show all MIDI Inputs at the top of the list, MIDI Outputs at the bottom. You must scroll to the middle of the list to see the MIDI out ports.

6. Click on the **Test** button. This will transmit a packet of data to the AWS which then in turn should return an acknowledge packet back to the computer. If the test was successful the message 'Comms test passed, now use send' will be displayed. If the test fails you should check that the correct Midi port has been selected and repeat the test.



7. Once you have established a valid connection click on the **Send** button. The new code will now be transferred to memory on the AWS CPU card. This process will take approximately 50 minutes due to the slow data transfer rate of MIDI and the error checking of each packet transmitted. A progress bar and transfer counter will be displayed on screen to enable you to observe the transfer progress.
8. Once the code been successfully transferred click on the **Save** button to store the new software. This takes approximately 60 seconds. A progress bar allows you to observe the saving process.

   During this time it is important that power to the AWS 900+ is not interrupted. To enable new software to be written into flash memory the AWS must first erase the current software. If this process is interrupted by a power failure then the AWS will be left with no valid software. In this state the AWS will be unable to re-boot. If this should happen the AWS CPU will default to a MIDI download state and you will have to repeat the download process.
9. Once the software has been saved a message will appear 'SAVE COMPLETED SUCCESSFULLY!'
10. Turn the desk off and on and check that the console boots correctly.

System Requirements

PC users should ensure that they have the latest version of Java installed.
This can be downloaded from http://www.java.com. There is a link to this address on the AWS download page.

Mac OSX users will need to download the 'plumstoneserv.jar' file from the AWS download page.
Drag this file into the '/Library/Java/Extensions' folder then restart the Macintosh before running the upgrade utility.

Section 7 – AWSomation

Overview

AWSomation™ is a fully featured automation package, developed from SSL's renowned G and K Series Ultimation systems, but with a feature set designed specifically for the AWS 900+. AWSomation™ utilises the classic SSL look and feel, familiar to thousands of engineers worldwide, to add dynamic fader and cut automation to the console. MTC (MIDI Time Code) serves as the mix timeline reference together with support for MMC (MIDI Machine Control) locate commands to follow non-play speed positional changes from the DAW. Use of System Exclusive MIDI data transfer allows mixes to be saved to a workstation or SysEx librarian, retaining the integrity of the project data.

Key features

- Frame accurate fader and cut automation data
- Moving and non moving fader modes
- Trim updates
- Fader links
- Mix Pass history
- AutoTakeover
- Variable glide times
- Fader safe mode
- Match and Play Cut automation updates
- Mixes and Fader Links are saved as SysEx MIDI data together with Total Recall data (if applicable)

The AWS 900+ AWSomation package is a chargeable option for the AWS 900+ console. Consoles that have the option installed will display an 'A' logo in the top corner of the TFT screen. The system uses the inboard TFT screen to give a graphical display of all 24 channel faders and the stereo bus faders (MIX and REC busses). When automated, the movements of the faders will be visible on screen.

Installation

An AWSomation activated version of the current AWS 900+ software must be downloaded from the SSL website to a Mac or PC that is connected to the AWS 900+ MIDI port. Please see the documentation on the CD Rom supplied in the AWSomation package.

Quick Guide

Quick Key

- **Trim** - page 7-7
- **Moff** (*Motors Off*) - page 7-8
- **TLock** (*Trim Lock*) - page 7-8
- **Snap** - page 7-9
- **AT** (*AutoTakeover*) - page 7-9
- **Match & Play** - page 7-9
- **CS** (*Copy/Swap*) - page 7-10

For quick, simple guides of how to use your AWSomation, please visit the SSL website tutorials for the AWS 900+ at http://www.solid-state-logic.com/music/products/aws900/tutorials.php

Operation

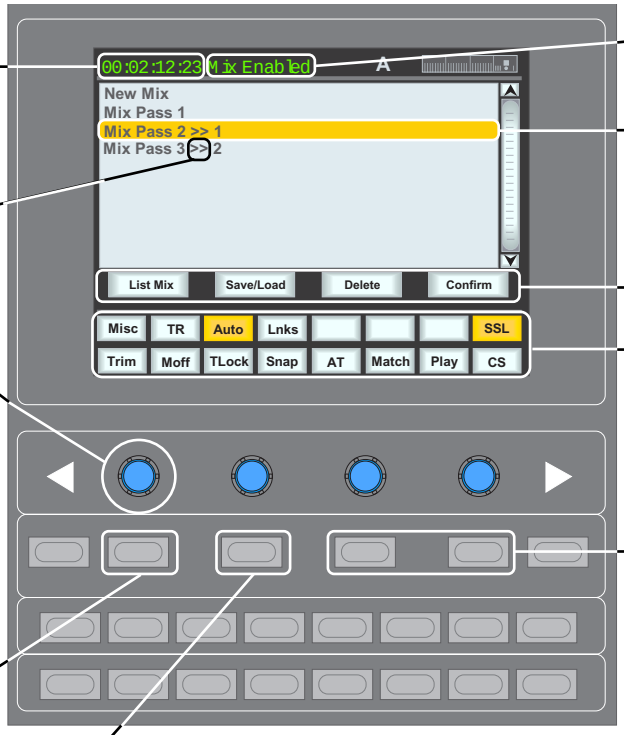
Accessing AWSomation

AWSomation is accessed using the soft keys on the Master Control Panel in the centre section. Refer to page 5-22 for an explanation of the use of soft keys if you are not familiar with this section of the console.

Use the soft keys to select **SSL** then **Auto** to access the main AWSomation menu.
The soft keys will now show a range of AWSomation options.

List Mix Menu

The **List Mix** menu is the main file menu for the AWSomation system. The main window shows a list of stored **Mix Passes**. To reach this menu press the **List Mix** key on the top row of soft keys.



MIDI Timecode

Mix Status

Yellow cursor indicates the chosen Mix Pass

>> indicates that the Mix Pass # on the left, is based on the Mix Pass # on the right.

Shows function of the top four soft keys

Shows function of the lower sixteen soft keys

Left hand D-Pot scrolls through the list of mix passes. To create a new mix select New Mix and press the same rotary control. To create a mix based on a previous mix pass, select the desired mix and press the D-Pot.

Hold down **Delete** then press **Confirm** to delete the highlighted setup

Press the **List Mix** key to show all mixes

Press **Save/Load** to save Mix Passes as a SysEx MIDI dump, or to load mix passes from previous sessions

If the desk is turned off these settings will be lost. AWSomation Mix Passes must be saved to a stand-alone SysEx Librarian or DAW MIDI track for permanent storage.

New Mix Passes are numbered starting at '1'. If a Mix Pass is deleted (see below) then its number will not be re-used. The only exception to this is if all Mix Passes are deleted. The numbering will then restart from '1'.

Changing the selected Mix Passes

The left D-Pot can be used to scroll through the list of AWSomation Mix Passes. A yellow cursor indicates which Mix Pass is currently chosen to be modified. The D-Pot's push-push switch can be used to either start a New Mix, or select a previous Mix Pass to modify.

Deleting Mix Passes

Mix Passes can be deleted from memory by highlighting the Mix Pass you wish to delete, holding down the **Delete** soft key and pressing the **Confirm** soft key.

Saving Mix Passes to a Mac or PC

All the stored Mix Passes can be saved as a System Exclusive (SysEx) dump to any software package that supports MIDI SysEx dumps. In practice this includes most packages and you would normally save the AWSomation mixes to an additional track in your current DAW project so that your mix data is stored with the rest of the project.

To save AWSomation Mix Passes to Mac or PC do the following:

- Create an additional MIDI track in your DAW program.
- Select its input and output to be AWS MIDI port 4.
- If available select the track to store System Exclusive data.
- Record enable the MIDI track.
- Press **Play** and **Record** on the AWS 900+ motion control panel to put the MIDI track into record.
- Press the **Save** soft key to start transmission of all saved AWSomation Mix Passes. The on-screen **Save** box will remain yellow until all data has been transmitted.
- Once the **Save** box has turned grey press **Stop** to end recording.

Will highlight yellow until **Save** is complete - the same applies to **Load** key.

Note

- The AWS 900+ uses the same MIDI port for saving and loading mixes and receiving MTC. SysEx data will interfere with MTC transmission, so ensure these tracks are muted while mixing.
- The time taken to transmit each AWSomation Mix Pass varies depending on how much automation data each Mix Pass contains. An unlimited number of AWSomation Mix Passes can be stored in this way.
- Large mixes can generate SysEx dumps of more than one minute, which some DAWs are incapable of recording. Please ensure your DAW can cope with large SysEx dumps.

Loading Mix Passes from a Mac or PC

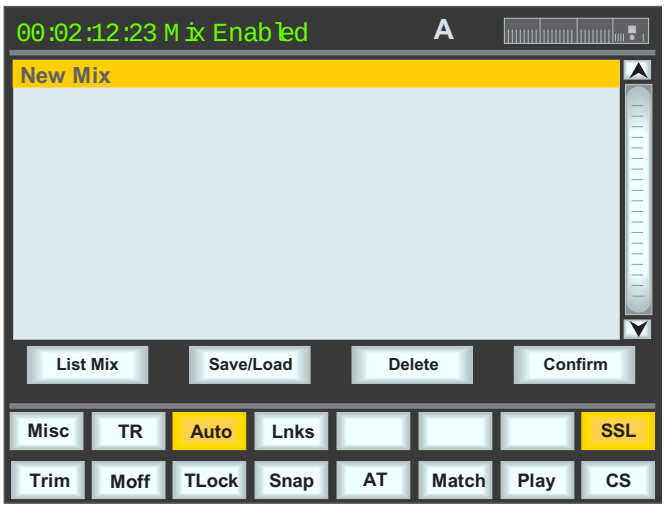
Restoring Mix Passes from a Mac or PC is even simpler:

- Locate the DAW to just before the SysEx data containing the Mix Passes you wish to load.
- Press the **Save/Load** soft key.
- Press the **Load** soft key.
- Play through the SysEx block of data. As soon as the AWS 900+ detects the start of valid data it will delete all the current Mix Passes and replace them with the stored ones from the MIDI track.

Because the Load process replaces your current Mix Passes with the ones stored on your Mac or PC you should check you have saved any Mix Passes you wish to keep before loading new ones.

Creating A Mix Pass

To create a new automation mix, press **List Mix** to enter the screen below, use the left D-Pot to highlight the **New Mix** entry, then press the D-Pot's switch to select the New Mix Setup page.



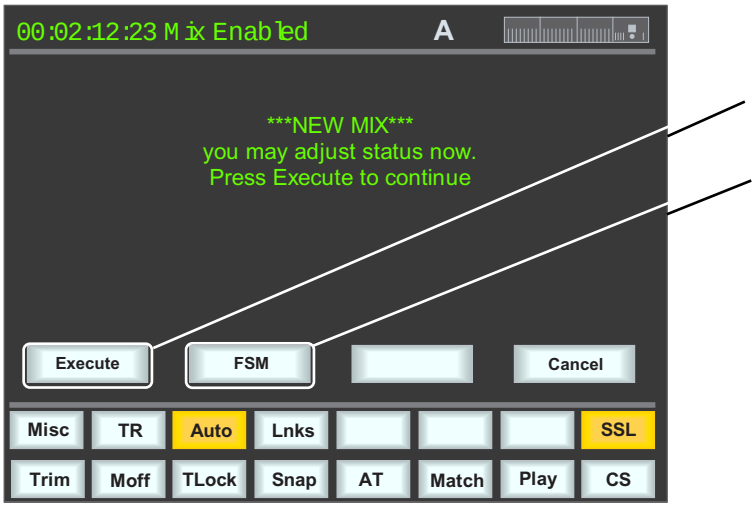
New Mix Pass Modes

Absolute mode: All automated moves are written at the current fader position.

Manual Mode: Manual mode has no LED display and makes the fader operate as a monitor fader only, i.e. no information will be written to memory.

New mix setup

All the channel faders will enter Absolute mode, indicated by the red LED next to the fader. Faders can be toggled between Absolute and Manual using the fader status key located next to the fader, or globally using the **FSM** (Fader Status Master) key, see below. Current automation status is displayed in the scribble strip above the fader replacing the standard 'Fader ##' label. The Status line will show '**Mix Enabled**'. The DAW should be positioned a few frames earlier than the required starting point to allow the mix system to lock to the incoming timecode.



Press the **Execute** switch to continue.

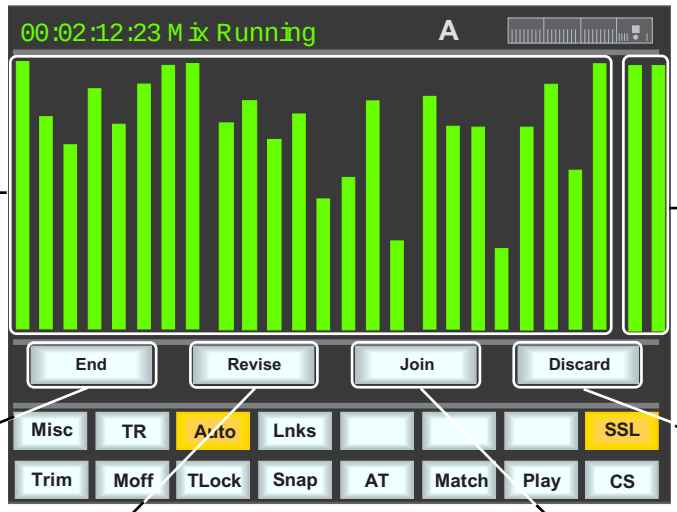
Press **FSM** to toggle all channels from Absolute to Manual Mode.

Cancel will return to the List Mix page.

To start a mix, press **Execute**. The screen switches to show level bargraphs for the 24 channel faders and the two main faders, (for the **MIX** and **REC** busses). The system saves a Global Static reference mix of the fader levels and cut status at their positions when the **Execute** key is pressed. This is useful because it allows you to locate before the start of the mix and recover your original levels (i.e.reference mix). Also, if you are writing automation in a section that had no previous mix data, when you drop out of write the faders go back to their original levels.

Mix Running

Press **Play** on the DAW to move forward and as soon as the Mix system has locked to the MIDI timecode (MTC), the Mix Status display will indicate '**Mix Running**'. Simply move the faders and press the cut switches to write your mix automation, and the fader moves and cut data will be recorded. The DAW may be toggled freely between **Stop** and **Play** and if **Fast Forward** is used or the DAW is located forward, the automation data will be extended to the new position and returned to play.



24 Channel Faders

Stereo Bus Master Faders

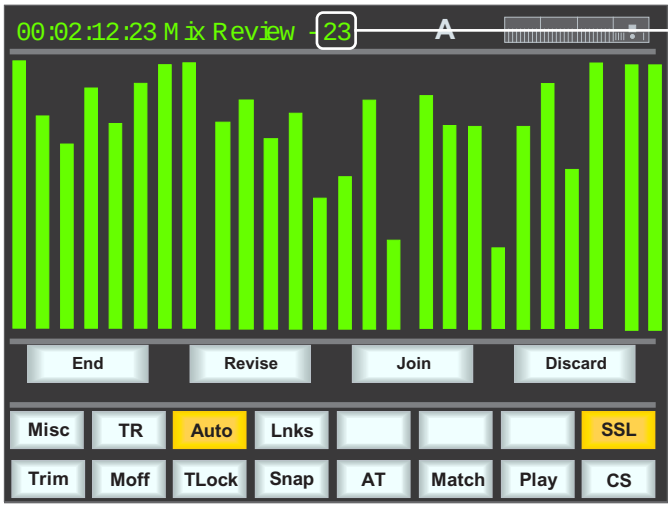
Press **End** to save the current Mix Pass and return to the List Mix menu.

Press **Discard** to abort the current Mix Pass

Revise returns faders and cuts that were in write when you rolled back to write at the current mix level.

Join returns faders and cuts that were in write when you rolled back to write at their levels at the rollback point.

At any time you can rewind the system, and as soon as the DAW is located to an earlier time and valid MTC or a MMC locate position command is received, the mix system enters '**Mix Review**'. All faders will switch to **Replay** status (all LEDs are off). This operation is known as a **rollback**.



Indicates how many times you have rolled back. Every time the Mix Review number will increase by 1.

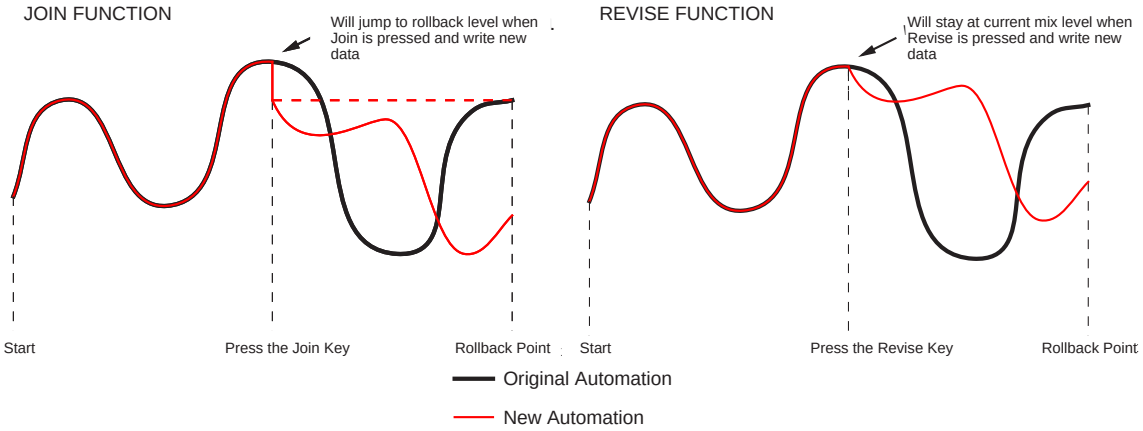
Mix Running Status - displayed while writing new automation data
Mix Review Status - displayed when rolled back and playing previous automation data.

When the DAW returns to **Play**, previously written automation data is replayed. If no faders are returned to write, all faders in write at the start of the mix will drop back into write at the point where the DAW was rewound (the 'rollback point', and the Mix status will return to **Mix Running**. Whilst in **Mix Review** you may rollback as many

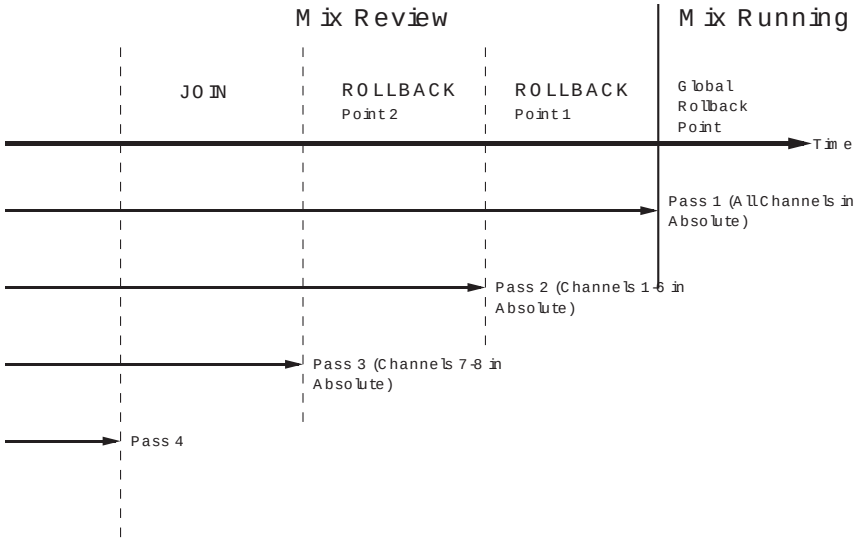
times as required to allow the mix to be built up fader by fader. Each time a rollback takes place, the rollback counter in the mix status display increments. Faders in write at a rollback point will automatically switch to write when the system plays through the rollback point.

JOIN AND REVISE

At any time during Mix Review, the **Join** key can be used to switch all channels originally in write at the last rollback point back to write at the levels or state they were at the rollback point. This is useful, for example, when balancing a chorus level. When you have achieved this balance, you can rollback, hit Join and the levels will punch in at the balance set before rollback, and all channels immediately return to write.The **Revise** key has a similar action except that all channels in write at the Rollback point are returned to write at their current mix position. This is useful if you have been automating a section, but made a small mistake. Just rollback prior to the mistake, hit Revise and the channels will immediately go into write at the current fader level, allowing you to overwrite the mistake.


JOIN FUNCTION
Will jump to rollback level when Join is pressed and write new data
Start
Press the Join Key
Rollback Point
REVISE FUNCTION
Will stay at current mix level when Revise is pressed and write new data
Start
Press the Revise Key
Rollback Point
Original Automation
New Automation

Multiple Rollback memories are supported so that successive operations of **Join** or **Revise** return different sets of faders back to the write state, if multiple Rollback operations have taken place.



To return all faders to Absolute, operate the **Join** or **Revise** keys until the Global Rollback memory is reached, at which point all faders return to write either at the current position, via the **Revise** function, or at the balance at the Global Rollback point, via the **Join** function.

DISCARD

If the system is in play or stopped following a Rollback operation with any faders or cuts in Absolute mode, Discard clears any data made since the start of the Rollback pass and forces all channels in Absolute back to Replay. The Discard label is only shown when there is Mix data to discard.

UPDATING A MIX PASS

To update a Mix Pass, select the desired Mix Pass from the list on the List Mix menu by turning the left D-Pot and press the D-Pot switch. 'Updating Mix Pass' will be displayed and the selected mix will now be the reference mix.

SELECTING PROTECTION

There are 3 different protection modes when automation data has been written; Auto, Safe and Manual.

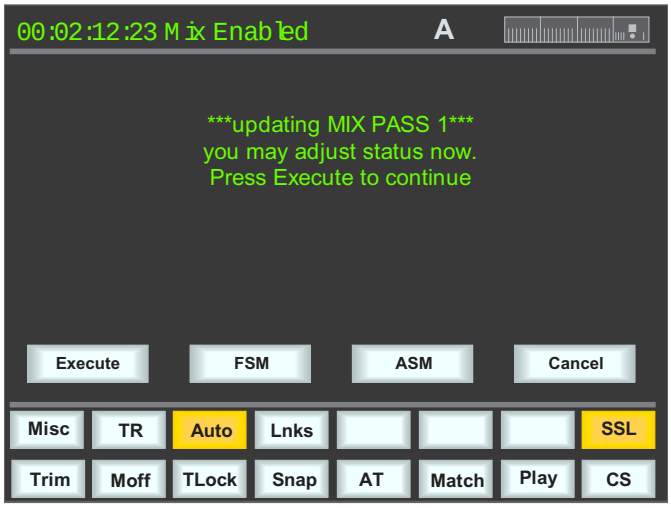
Auto - If moves need to be rewritten from scratch, then the faders can be dropped into write by pressing the auto switch similar to setting up for a new mix. Otherwise faders can be dropped into write once the mix is running, either by switching the fader touch sensor, or the fader auto switch.

Safe - Existing fader and cut automation data can be protected via the **Safe** option. In **Safe** mode the channel automation is replayed but no automation data can be written to these channels.

Manual - Existing automation data is protected and the fader and cut switch act directly on the channel audio. No automation is written or played back.

UPDATE MODE

The **FSM** key will toggle all faders between Absolute and Replay.



To select the different protection modes, press the **ASM** switch, and then press the fader auto switch on the desired channel to switch between modes. To globally select the mode, press the **ASM** switch then the **FSM** switch to switch between modes. The modes are displayed in the scribble strips above the faders.

AUTOMATION OPTIONS

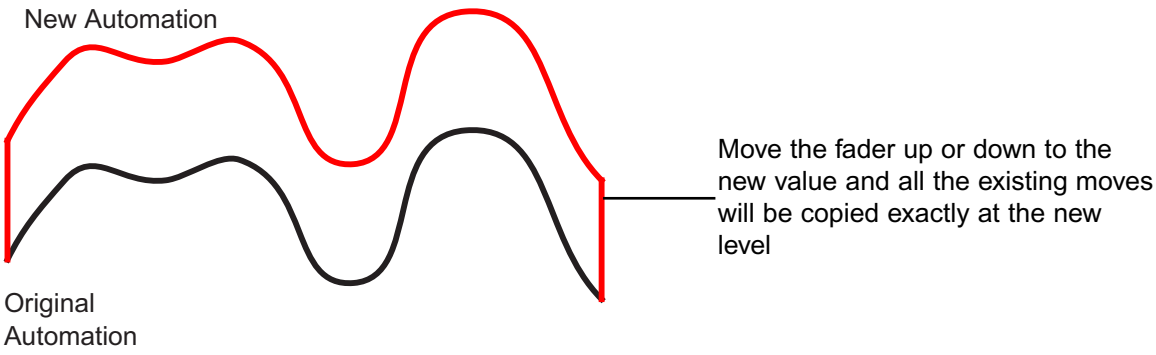
TRIM

A method of updating fader data is to **Trim** the previous Mix Pass data. **Trim** mode originates from VCA (non-moving fader) automation systems and uses the fader to add or subtract level from the existing moves. It achieved this by setting up a 'null' fader position and then any subsequent moves trim the existing data by the amount of positive or negative change from the null point. Trim is useful, for example, when you have a complex automated vocal line which needs raising by 2dB. Rather than trying to re-write the complex moves, simply rollback, hit Trim and move the fader by +2dB. Locate to the end of the vocal line that needs this level increase, and press the End soft key to commit the trim to a Mix Pass.

The Trim mode is enabled by pressing the **Trim** key. Once active, faders can write in Trim, at anytime except during the first pass of a new mix, during Mix Running or in Mix Review. Trim is indicated by the green status LED next to the fader. When Trim is available at the start of the Mix, the **FSM** key will toggle all faders between Replay and Trim.

Trim can be used with the fader motors On or Off. If the motors are On, the null point will be the fader position prior to selecting the trim auto switch or touching the fader. If the motors are Off, the fader can be positioned at a

suitable reference point on the scale before entering the Trim update status by pressing the fader switch. AWSomation features SSL's 'auto-nulling' feature so that each time Trim is re-enabled a new null point is set. When writing a Trim move, the dB trim value is displayed in the scribble strip above the fader.

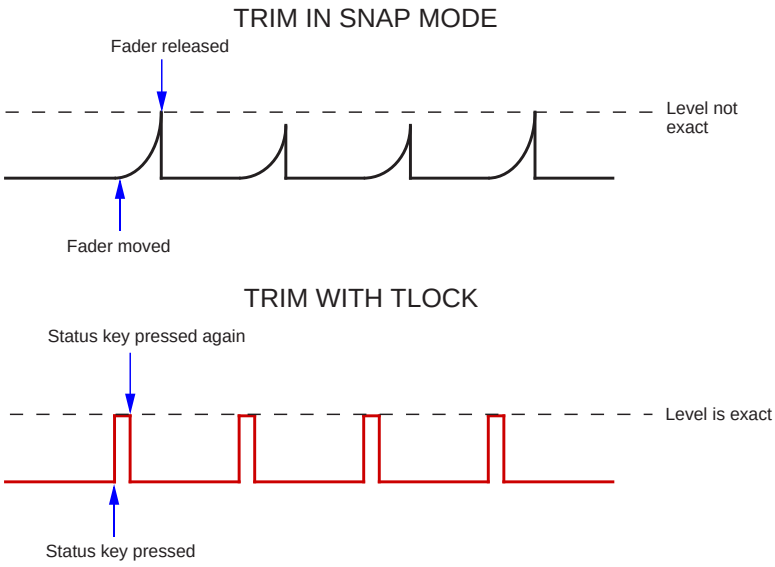

New Automation
Original Automation
Move the fader up or down to the new value and all the existing moves will be copied exactly at the new level

Both **Autotakeover** and **Snap** functions (see below) used in conjunction with a Trim update allows a seamless or smooth return to the stored mix data.

When **Join** is used with faders in Trim at the Rollback point, any Trim offset will be retained and written from the point that the Join key is operated. **Revise** returns any fader in Trim at the Rollback point back to write but with a new null point to avoid a level jump.

TLock

TLock - Trim Lock - defeats the auto nulling feature of the standard Trim function and 'locks' the null point to the position that the fader was in when Trim was first enabled in the current Mix Pass. This enables a defined trim offset to be repeatedly punched in and out throughout the subsequent Mix Pass. Deselecting **TLock** clears any stored nulled points. AutoTakeover can be used when **TLock** is active, however **Snap** and **TLock** are mutually exclusive; selecting one deselects the other and vice versa.



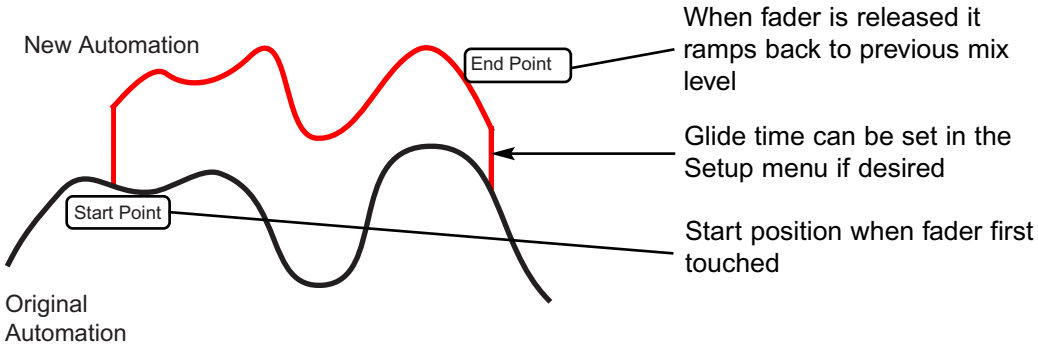
An example of TLock would be bringing up the levels of guitar licks in a track. If Trim is used in Snap mode, the fader can be raised and let go repeatedly, returning to the previous level. However it is difficult to have an identical increase in level each time when using manually. If we use TLock, the reference value will be set, and the fader will be moved to the correct raised level. Every time you press the fader status key it will jump to that level, and when pressed again, it will return to the reference value. There will be no glide times and value will be identical.

Motors Off

Moff - Motors Off - this mode suspends the motorised playback of Mix data via the moving faders. In this mode it will emulate a VCA automation system. **Moff** automatically activates the fader **SuspdAll** Links function (see later).

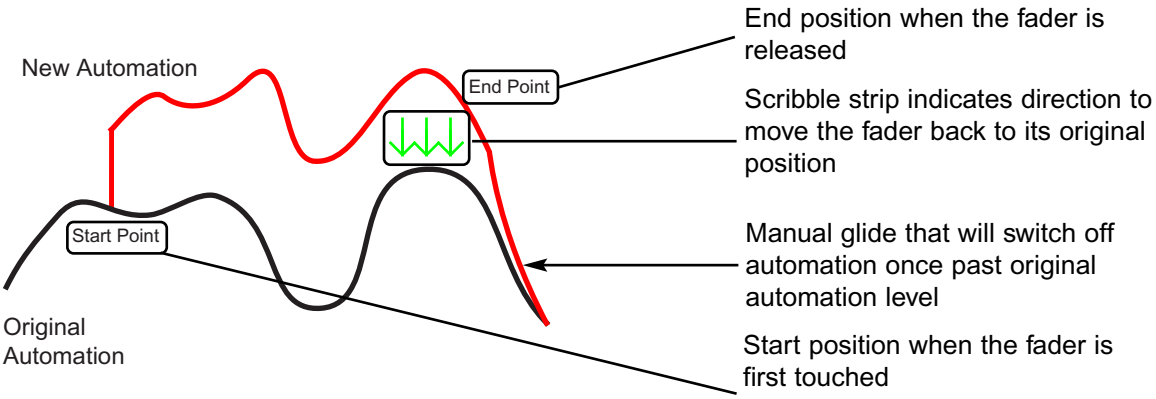
SNAP MODE

Snap mode uses the fader touch sensor to control both the start and end of a fader update for fast hands on changes to mix levels. When the fader is released it ramps back to the previous mix level at a user determined rate, then returns to replay.


New Automation
End Point
When fader is released it ramps back to previous mix level
Glide time can be set in the Setup menu if desired
Start Point
Start position when fader first touched
Original Automation

AUTOTAKEOVER

To avoid a level jump when dropping out of write, **AutoTakeover** introduces nulling indicators in the scribble strip to display the direction to move the fader to match the underlying mix level. When the fader crosses the current mix level, it is automatically returned to replay and disconnected from the audio gain element. The fader returns to following the mix data as soon as it is physically released.


New Automation
End Point
End position when the fader is released
Scribble strip indicates direction to move the fader back to its original position
Start Point
Manual glide that will switch off automation once past original automation level
Original Automation
Start position when the fader is first touched

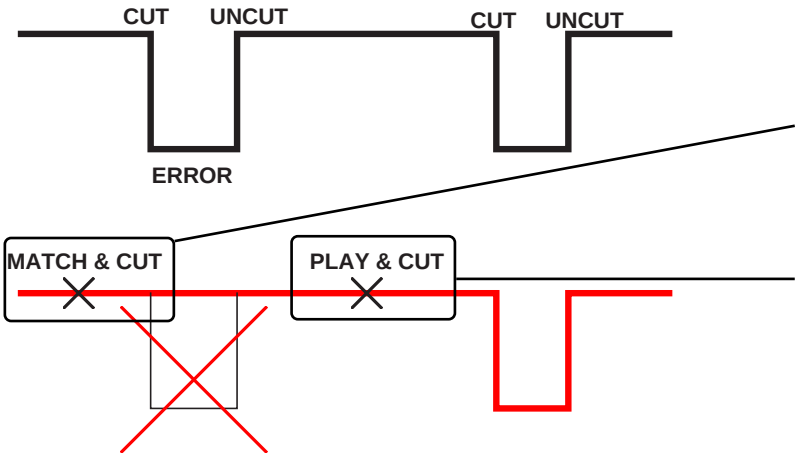
CUT AUTOMATION

Pressing a cut switch will toggle it's state and automatically start writing data. It can be returned to replay either by rolling back or by selecting the soft **Play** key, then pressing the cut switch.

The state of the channel **Cut** switch is stored separately from the fader data. **Cut** data is stored regardless of the current fader status unless channel **Safe** mode is selected. Whenever the **Cut** switch is in write, a '✲' symbol is displayed in the scribble strip above the fader.

Match followed by the **Cut** switch drops the channel into Write without changing the current state of the Channel **Cut**. **Match** and **Play** are mutually exclusive. If one is active, selecting the alternate function cancels the first one.

Match and **Play** are automatically deselected after each operation unless the Latching option is enabled in the **Setup** Menu.



If you have made a cut error, position the DAW before the error, resume play, select Match and then press Cut to automatically drop into write without changing its current state.

When the cut has been over written, select Play and then press Cut to resume playing original automation.

Copy and Swap

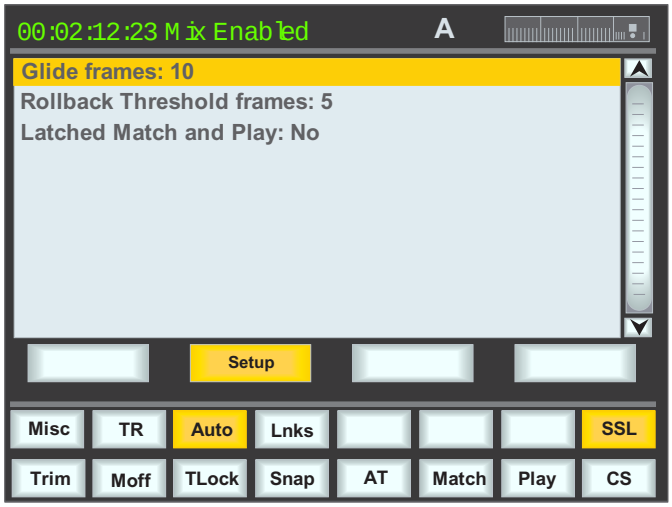
CS - **Copy** and **Swap** - are used to interchange or transfer mix data between channels. The required function is selected by pressing the **CS** key to toggle through modes. **Copy** is displayed as a highlighted **Cpy**, **Swap** as an **Swp**. Select the function required then hold down the source channel auto switch then press the destination channel using its auto switch. Whilst the auto switches are active, '**src**' and '**dest**' will be displayed in the scribble strips above the fader. To **Copy** or **Swap** automation data the system must be in Mix Running or Mix Review.

Copy is to a single channel only. To copy to multiple channels, repeat the **Copy** operation as many times as required.

The new Mix data is not saved until the subsequent Mix Pass is Ended.

SETUP MENU

The **Setup** menu contains various options for the mix system. To display the Setup menu end your Mix Pass, deselect the **List Mix** Key and press the **Setup** key. Scroll to the option to be edited and select using the left D-Pot push switch. Once the option is active, the left D-Pot will increment/decrement a numerical value as it is turned or page through the various option states. Press the D-Pot push switch a second time to complete the setup operation.



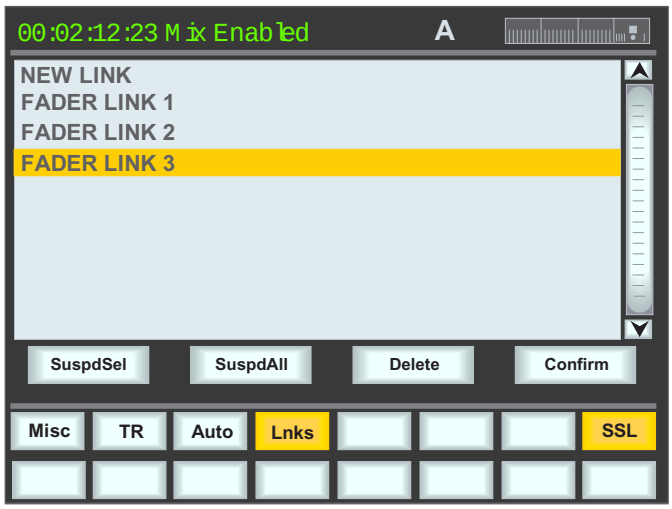
Glide Frames - Sets the ramp time in frames for Snap mode. The range is from 0 (no glide) to 255 (10 second glide).

Rollback Threshold frames - Sets the number of consecutive descending frames that the systems needs to see to determine if a rollback has taken place. The range is 2-10 and the default is 2 frames. Increase as required if a rollback occurs on stopping the timecode master.

Latched Match & Play - Normally **Match** and **Play** are automatically deselected after a **Cut** switch is operated. This option latches the **Match** or **Play** function until deselected manually.

Fader Links

Fader Links are a useful method of ganging channels without the complexity of a Master/Slave style grouping system. In a **Fader Link**, operating any Fader, Cut, Solo or Status switch will apply the same action to all the channels in the Link. Fader retain any level offsets provided no fader in the Link reaches the upper or lower extremes of the fader scale. If any member of a link reaches the end of its physical travel all members of the link will not move beyond this point. To access Fader Links, press the **Lnks** soft key next to the **Auto** key.



To set up a new Link scroll to **New Link** and press the D-Pot push switch. This will create a new entry in the list suffixed with a number. This entry will be automatically highlighted and faders can be added (or removed from the Link) by pressing the fader auto switch. Link numbers are shown in the scribble strip above the fader and the read fader status LEDS will indicate the faders in the currently selected Link.

To adjust the Link balance, hold one fader whilst moving another. This automatically isolates the second fader from the Link whilst the remaining faders continue to track the first fader touched or use Suspend.

As far as the automation system is concerned, operating one fader places all the faders in the Link in write. Links can be dissolved at any time and all the automation data will still play out correctly.

To edit the existing Links, scroll to the Link. Channels can be added or removed by pressing their auto switches.

SuspdSel/SuspdAll

Links can be globally or individually suspended at anytime. A link which is suspended will allow the user to move all faders independently.

If a Link is highlighted, then the **SuspdSel** key will deactivate the selected Link and 'suspended' will be shown next to the link number.

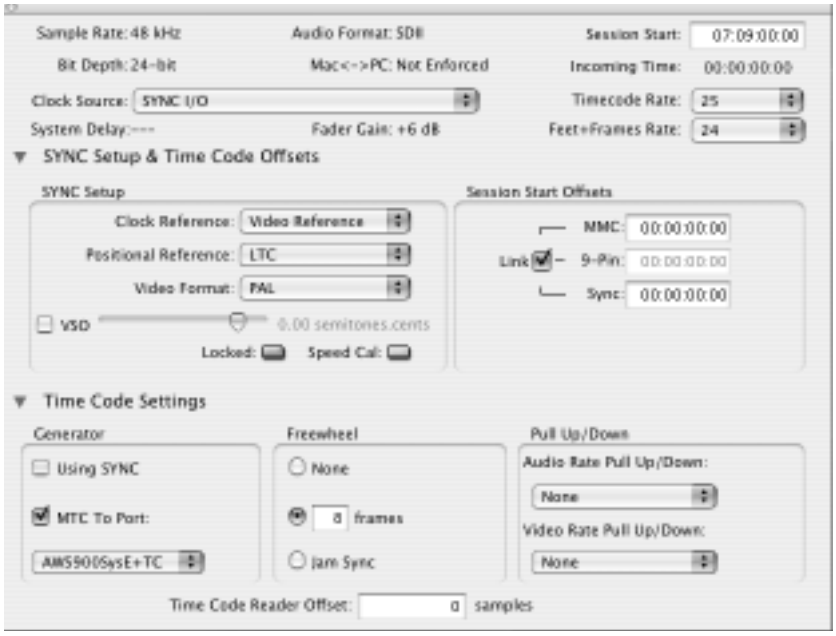
SuspdAll will suspend all links in the list. **Moff** automatically activates the **SuspdAll** function.

Delete

To delete a Link highlight the Link, then use the **Delete** and **Confirm** keys.

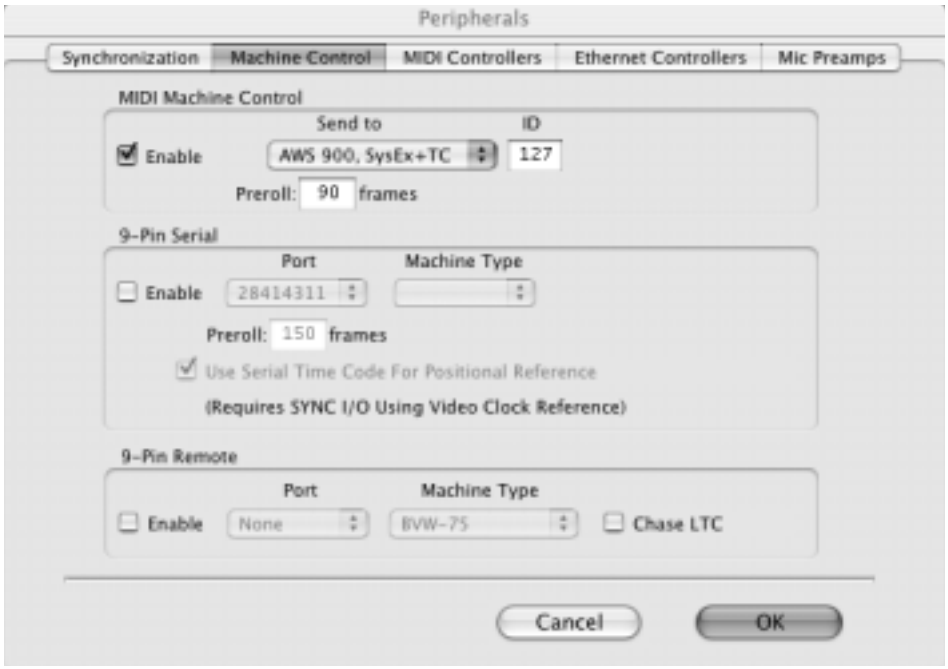
Pro Tools Setup Notes

To set up timecode generation: **Windows/Show Session Setup**



Select the MTC option and select the port on the MIDI interface that is connected to AWS Port 4 MIDI IN. Also select the timecode rate for the session and the session start time. *It is expedient to make a note of the timecode standard that was used for a particular AWS mixing project. AWSomation automatically detects the timecode standard from the incoming MTC messages. It will quite happily attempt to play out stored mix data to incoming timecode with a different frame rate, but this will result in small but potentially annoying timing errors in automation playback.*

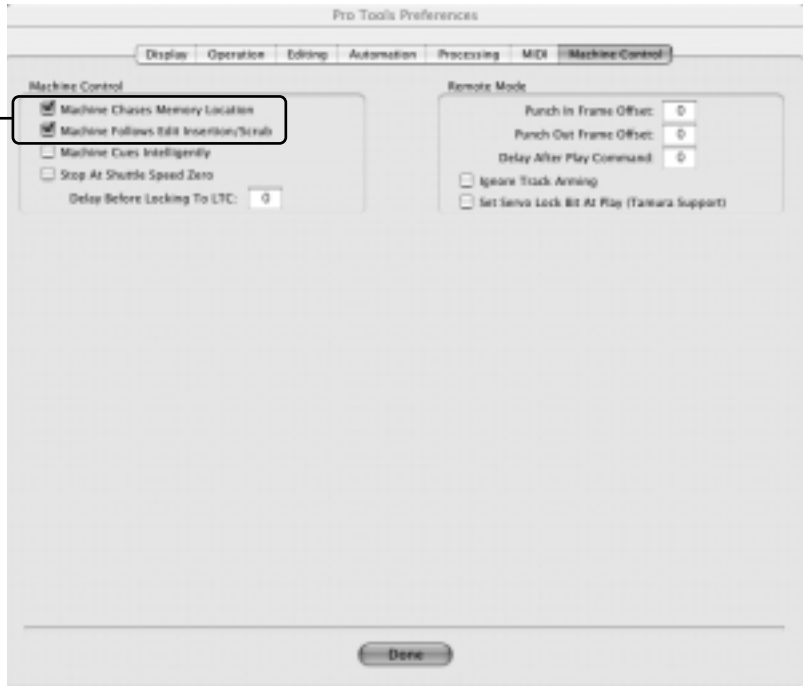
To set up MMC locates: **Setups/Peripherals**



Enable MIDI Machine Control and select the Port on the MIDI Interface that is connected to AWS Port 4 MIDI In. Leave the ID as 127 (this sends to all connected devices).

Setups/Preferences

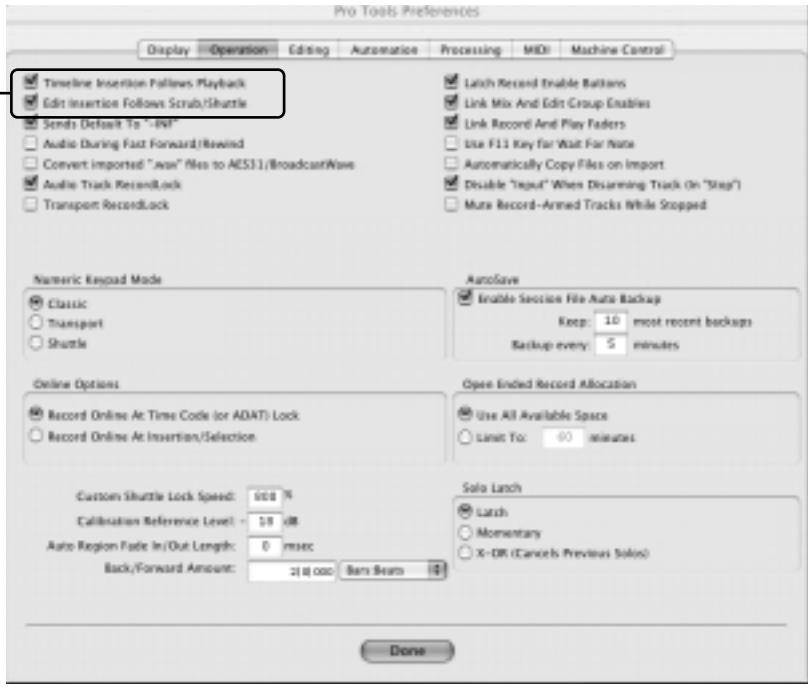
Enable these options



Enable the two options circled above. This ensures that the MMC locate messages are transmitted correctly from Pro Tools.

Finally: Setup/Preferences

Enable these options



When mixing with the AWS 900+ it is advisable to enable the two options circled above. This ensures that a Rollback operation will occur following a locate or rewind operation in Pro Tools. If the first options are not enabled, then Pro Tools does not send a locate command following a Stop command even though the desk counter will show the position that Play last occurred from and where Play will resume from. The AWSomation Rollback will then occur when the system is returned to play which can be disconcerting. Enabling the option ensures that Rollbacks occur prior to entering play but at the expense of defeating the Pro Tools feature of automatically returning to the last Play position following the Stop command.

Please note that the AWS 900+ uses the same MIDI port for saving and loading mixes and receiving MTC. Ensure that any MIDI tracks containing SysEx data are muted while mixing, as SysEx data will interfere with MTC transmission.

Appendices

Specification

Performance Figures

Headroom	< +27dBu @ 1kHz (< 1% THD)

Mic To Insert Send (max gain)

Frequency Response	±0dB at 20Hz, +0/–0.08dB at 20kHz, –4dB at 200kHz
Noise:	< –127dBu EIN 20Hz - 20kHz

Line In To Direct Out

Frequency Response	±0dB at 20Hz, +0/–0.08dB at 20kHz, –3dB at 135kHz, –6dB at 195kHz
Noise	< –89dBu 20Hz - 20kHz
THD	< 0.002% @ 1kHz (+24dBu, 80kHz filter)

Line To Track And Aux Bus Out

Frequency Response	±0dB at 20Hz, +0/–0.08dB at 20kHz, –3dB at 135kHz, –6dB at 185kHz
Noise	< –89dBu (no channels routed)
	< –80dBu (all channels routed)
THD:	< 0.002% @ 1kHz (+24dBu, 80kHz filter)

Line To Mix/Rec Bus Out

Frequency Response	±0dB at 20Hz, +0/–0.08dB at 20kHz, –3dB at 135kHz, –6dB at 185kHz
Noise	< –89dBu (no channels routed)
	< –84.5dBu (all channels routed)
THD:	< 0.002% @ 1kHz (+24dBu, 80kHz filter)

Size and Power

Height (maximum)	925mm	(36.4 inches)
Height of Faders	723.4mm	(28.5 inches)
Height Adjustment	+20/–10mm	(+0.8/–0.4 inches)
Width	1,445mm	(57 inches)
Depth (maximum)	873mm	(34.4 inches)
Heat Dissipation	Less than 600 Watts	
Supply Voltage	90 - 250 Volts, Auto Ranging	
Supply Current	5.5 - 2.0 Amps	
Power Factor	0.95	

Service & Warranty Information

Introduction

Service will be primarily by on-site board exchange.
The AWS 900+ contains a mix of analogue and digital boards. All use SMT (Surface Mount Technology) extensively and it is not possible to carry out field repair to component level, although electro-mechanical parts such as pots and switches can be replaced by a suitably trained technician. Replacing the entire console is unlikely to be an option due to the size of the console and the availability of a replacement.

Many of the assemblies in the AWS 900+ are designed to be replaced by a technically aware person.
The quickest way to resolve a problem is for your local distributor to supply you with a replacement part for you to fit. **Troubleshooting** – see page A-6 – lists those assemblies that may be changed by untrained staff, and gives instructions on how to change these items.

Warranty

All systems include 13 months on-site warranty from date of shipment or 12 months from date of delivery to the end user, whichever is the longer. The warranty covers all parts and labour, but does not include travel and accommodation expenses if an engineer has to travel more than 75 miles (120 kilometres) to your facility. Consumable items such as lamps, accidental damage and damage caused by operation of the equipment outside of Solid State Logic's recommended operating conditions (see Sections 1 and 3 of this manual) are not covered by this warranty. Further details may be found in Solid State Logic's Conditions of Trading (printed on the reverse of all Solid State Logic invoices).

Note that service visits to remedy problems found to be caused by a fault in third party equipment will be charged for at Solid State Logic's current service rate.

Out of Warranty Repairs

Replacement assemblies will be charged at Solid State Logic's current service exchange price for the faulty part plus shipping costs. Service visits will be charged at Solid State Logic's current service rate.

What to do if you have a problem

Follow the instructions in the **Troubleshooting** section (page A-6), to confirm that the fault lies within the AWS 900+ system. If this suggests there is a fault with the AWS 900+, then contact your local distributor who will either supply a replacement assembly or arrange for a visit from an engineer to resolve the problem.

Website Support

Solid State Logic's website (http://www.solid-state-logic.com) includes fault finding tips, downloads of the latest AWS 900+ documentation, and an extensive Q&A knowledge base system.

Out-of-hours Support

Solid State Logic's out-of-hours pager service does not support the AWS 900+.

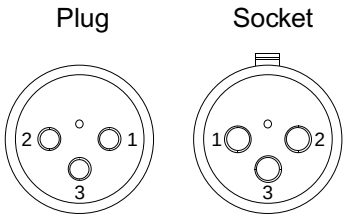
Audio Connectors and Pinouts

XLR 3-Pin

Dimensions: 19 x 60mm (approx)
Cable Dia: 4mm - 8mm (typical)

Pinout as used for balanced audio:

Pin 1	Screen/Ground
Pin 2	Hot (+ve)
Pin 3	Cold (–ve)

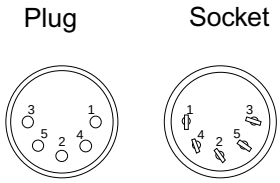


Connectors Viewed From Wiring Side

DIN 5-Pin 180°

Dimensions: 15mm dia.
Cable Dia: 4mm - 7mm (typical)

Typically used for MIDI interconnection



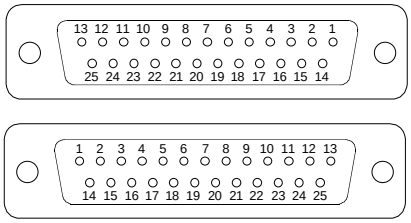
Connectors Viewed From Wiring Side

D-Type Multipin

Connectors Viewed From Wiring Side

25-way

Dimensions: 55 x 15mm (approx)
Cable Dia: 8mm (typical)



Plug

Socket

1/4' Jack

Dimensions: 15 x 90mm (approx)
Cable Dia: 4mm - 8mm (typical)

Pinout as used for balanced audio:

Sleeve	Screen/Ground
Tip	Hot (+ve)
Ring	Cold (–ve)

Pinout as used for unbalanced audio (Instrument Inputs only):

Sleeve	Screen/Ground
Tip	Hot (+ve)

Pinout as used for Foot Switch Inputs :

Sleeve	Screen/Ground
Tip	Control Input - pull to ground to activate

AWS 25-way D pinouts

Connector: 25-way D Female

cct	Hot	Cold	Screen	EXT A Inputs 1-4	Ext B Inputs	Meter Out
1	24	12	25	Left	1 Left	Left
2	10	23	11	Right	1 Right	Right
3	21	9	22	Centre	2 Left	Centre
4	7	20	8	LFE	2 Right	LFE
5	18	6	19	Left Surround	3 Left	Left Surround
6	4	17	5	Right Surround	3 Right	Right Surround
7	15	3	16	n/c	4 Left	Solo Left
8	1	14	2	n/c	4 Right	Solo Right

Connector: 25-way D Female

cct	Hot	Cold	Screen	Monitor Insert Send	Monitor Insert Return	Mon A
1	24	12	25	Left	Left	Main Left
2	10	23	11	Right	Right	Main Right
3	21	9	22	Centre	Centre	Main Centre
4	7	20	8	LFE	LFE	Main LFE
5	18	6	19	Left Surround	Left Surround	Main Left Surround
6	4	17	5	Right Surround	Right Surround	Main Right Surround
7	15	3	16	Lt to Decoder	Lt From Encoder	Mini AL
8	1	14	2	Rt to Decoder	Rt from Encoder	Mini AR

Connector: 25-way D Female

cct	Hot	Cold	Screen	Mon B	8 Track Out	Cue/FX Out
1	24	12	25	Alt Left	Bus 1	Stereo Cue AL
2	10	23	11	Alt Right	Bus 2	Stereo Cue AR
3	21	9	22	Alt Centre	Bus 3	Stereo Cue BL
4	7	20	8	Alt LFE	Bus 4	Stereo Cue BR
5	18	6	19	Alt Left Surround	Bus 5	FX 1
6	4	17	5	Alt Right Surround	Bus 6	FX 2
7	15	3	16	Mini BL	Bus 7	FX 3
8	1	14	2	Mini BR	Bus 8	FX 4

RED LIGHT / TALKBACK / GPI/O

Location:		Rear panel	
Connector Type:		25-way D-type female	
Pin	*Ribbon Pin*	*Description*	*Notes*
1	5	Red Light Relay contact 'A'	*Normally open – follows Red Light switch*
14	6	Red Light Relay contact 'B'	*" " "*
2	7	0V	
15	8	GP Input 1 (not used)	
3	9	GP Input 2 (not used)	
16	10	Monitor Cut	*Forces Cut when active*
4	11	Monitor Dim	*Forces Dim when active*
17	12	Slate Switch	
5	13	Listen Switch	
18	14	Red Light Switch	
6	15	TB All Switch	
19	16	FB A Switch	
7	17	FB B Switch	
20	18	Ext TB Switch	
8	19	+4V	*Max current 200mA (fused)*
21	20	Slate Tally	
9	21	Listen Tally	
22	22	Red Light Tally	
10	23	TB All Tally	
23	24	FB A Tally	
11	25	FB B Tally	
24	26	Ext TB Tally	
12	27	n/c	
25	28	n/c	
13	29	n/c	

Notes:
All inputs are active low (ie. connect to 0V to activate). Inputs are pulled up to +4V via a 3K9 resistor.
Inputs are diode clamped to 0V and +4V to protect the console circuitry.
All tallies are open collector with a 47R series resistor.
Red Light contacts rated at 125V AC @ 0.5A; 30V DC @ 1A; 110V DC maximum.

MIDI IMPLEMENTATION CHART

Function		Transmitted	Recognised	Remarks
Basic Channel	Default Changed	3	3	Channel 1 only
Mode	Default	7	7	Not Applicable
	Messages	7	7	
	Altered	7	7	
Note Number	True Voice	3	7	90 00 7F Echoed - Sent
		7	3	90 00 00 active sensing only
Velocity	Note ON	7	7	
	Note OFF			
After-touch	Keys	7	3	Meters
	Channels	7	7	
Pitch Bend		7	7	
Control Change		00-07 Faders	0C (2C) LEDs	Fixed specification
		(20-27)	Servo Faders	Fader resolution
		08-0B Ctrl Pots	Relays	(00-07 MSB)
		0D Jog wheel	Clicker	(20-27 LSB)
		0F (2F) Switches	Tone	
		40-4C V-Pots	Touch Off	
Program Change	True number	7	7	
System Exclusive		7	3	Character displays, System Parameters
System Common	Song Pos	7	7	
	Song Sel	7	7	
	Tune	7	7	
System Real-time	Clock (F8)	7	7	
	Commands	7	7	
	MTC	7	7	
	Local On/Off	7	7	
Aux Messages	All Notes Off	7	7	
	Active Sensing	7	7	
	System Reset	7	7	

Mode 1:Omni On, Poly Mode 2: Omni On, Mono 3 : Yes
Mode 3:Omni Off, Poly Mode 4: Omni Off, Mono 7 : No

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Troubleshooting

Introduction

The following pages are not intended to teach you how to repair any fault on your AWS 900+ console, they are merely designed to guide you through the basic principles of locating and, where possible, working around faults, until a replacement part can be obtained. The AWS console has been designed with a very modular approach to hardware, which ensures that maintenance is quick and simple. The vast majority of components that make up the console, are 'plug in' cassettes that simply require the removal of three screws to enable their replacement.

Locating Problems

You should always check external equipment first (unless the fault is obviously within the console – such as loss of signal when the EQ is switched in). The AWS 900+ spends the majority of its life in a stationary position, whereas microphones, their cables and effects devices etc. are constantly on the move, and hence are much more likely to incur damage.

Once you have established that the problem lies within the console, you need to determine whether the problem is due to an operational error, or hardware failure. The most common, and easiest to solve, problems are operational errors, and you should eliminate these first. Refer to the relevant section in this manual, and ensure that you have followed the correct procedure.

If you have confirmed that the problem is neither due to external equipment or operational error, then you may have a hardware fault. Check the troubleshooting table (on page A-14) for guidance. If your particular problem is not highlighted then you will have to diagnose the fault yourself, using the guidelines given below. Ensure that you read the paragraphs on **Replacing Modules** before attempting any maintenance.

In most cases, a fault can be located in minutes, with little technical knowledge. The key to correctly diagnosing a hardware fault is understanding the console's signal flow. Block diagrams detailing analogue signal flow, digital control bus structure and power wiring, can be found at the end of this section.

Hardware faults can be defined as one of three types: Audio, Control, or Power. Power faults, with the exception of a poorly seated connector or blown fuse, are probably best left to your distributor. If you wish to know more about the AWS 900+ power supply, you can download information from our website. Fault finding Audio and Control problems, however, is well within the capability of all users.

Audio Faults

Audio faults will most likely manifest themselves as partial, or total, signal loss, or distortion of the audio signal. Referring to the Channel and Centre section block diagrams, you can see that there are many possible signal paths through the console. Logical routing, and monitoring of signals at different points, will enable you to easily locate the faulty module.

To give an example of an audio fault, examine the following problem. By working through this example you will see the basic principles of fault finding at work. You have Channel 24 routed to Track Busses 1 and 2 pre-fader. When monitoring the Track Busses you notice that the audio can only be heard on the left monitor output.

Your first step is to refer to the AWS 900+ Centre Section block schematic. From this you will see that the channel's output passes through five different modules before reaching the monitors. We can halve the problem by checking the signal path halfway through the chain. The monitor meters are fed from the output of the 629951 module. Do the meters show the same level on left and right? If the meters show the same level then the problem is post the 629951 card on either the 629952, 629953 or 629954 card. If the meters show different levels, then the problem is either on the channel's output, the 629919X1 card or the 629951 card.

For the sake of this example we will assume that the level shown on the meters was different. Using the same principle we will try to eliminate modules from the signal path. Again referring to the AWS block schematics you can see that the Track Bus metering is taken post the 629919X1 card's output, but pre the 629951 module's input. Do the Track Bus meters show the same signal level? If they do, then the problem is on the 629951 card; if not then the problem lies with the channel strip or the 629919 module.

Again for the sake of the example, we will assume that the level on the Track Bus meters was different. Halving the signal path again, de-assign Channel 24 from the Track Busses, route the same signal to Channel 23 and assign it to Track Busses 1 and 2. Can signal be heard on the right monitor? If it can then you have identified in a matter of minutes that Channel 24 has a faulty Track Bus output stage. If audio cannot be heard, then you have identified that the 629919X1 Track Bus card is faulty.

The next step in either case would be to follow the module removal instructions below and re-seat the module in its slot to ensure that a valid connection is made. Once re-seated, test the signal path again. If there is no change, a replacement will be required.

Control Faults

Control faults will typically result in either the corruption of display information, or the failure of encoders and switches. The majority of the console's display and control functions are performed by the 629645X1 CPU, which is located behind Bay 3's Meter Panel. The CPU uses two methods of control. These are Multidrop Bus and Live Bus. Both busses are bidirectional and carry control data, such as switch presses, to the CPU as well as display data, such as LED illumination commands, to the displays.

Multidrop Bus data is used to control all of the console's audio processing modules, these are the 629921X1 Channel Strips, 629651X1 6-Track Select, 629652X1 2-Track Select, 626653X1 Gain and MDAC Control, 620654X1 Monitor Outputs, 629918X1/2 Dynamics, 629918X1/2 8-Track and Aux Bus, and the 629928X1 Compressor. All other panels are controlled by the Live Bus. Referring to the AWS 900+ Control Block Schematic you will see that four Multidrop busses, one per bay are used. The Multidrop data from the CPU is connected to each of the channel backplanes and the centre buscard using a 20-pin IDC ribbon connector. The audio processing card then sit on this bus, sending or receiving data as required.

The following problem highlights a Multidrop Bus fault and explains how the fault might be located. After powering on the console you notice that all of Bay 2's channel strip LEDs are extinguished, and the switches do not respond; all other bays are working correctly.

Once again refer to the AWS 900+ Control Block Schematic. From the diagram you can see that Multidrop Bus data for Bay 2 is connected to socket PL2 on the 629645X1 CPU. Power down the console and remove the channel meter from Bay 3 (refer to **Replacing Modules** on page A-10 for details). Located behind the channel meter is the CPU. Remove the metal screen which surrounds the CPU and locate connector PL2. Remove and then reinsert the connector to ensure that a sound connection is made. Re-assemble the console and check the condition of the fault.

For the sake of the example we will assume that this did not resolve the problem. The next step would then be to inspect the other end of the Multidrop Bus connection. The diagram shows that the data ribbon connects to the CPUA socket on the 629640X1 Channel Backplane. Power down the console and remove Channels 15 and 16 as instructed in **Replacing Modules** (page A-10). Locate the CPUA connector and re-seat, then reassemble the desk and check the fault.

Again we will assume that in this instance this did not resolve the problem. This leaves three possible causes. The first is that the channel backplane has developed a fault. The second is that one of the channel strips in Bay 2 has failed in such a way as to corrupt the data on the Multidrop Bus. The third is that the CPU card has developed a fault with the hardware that processes Multidrop Bus 2.

The first cause is highly unlikely. The channel backplane contains no active components, only copper tracks, and as such can be discounted. The second cause is possible – to determine this, remove the channel strips from Bay 2, one by one, ensuring you power down the console each time, and check the condition of the fault. If, after removing a module, the remaining channel strips start to function, then you have located the problem. If you reach the last module and the fault still occurs, don't forget to swap the remaining module with one of the others to ensure it is not the cause of the problem. If the fault still persists then the cause must be the CPU. Once again, through a simple process of elimination, the cause of the fault has been located.

Unlike the Multidrop Bus which allows modules to be added and removed from the bus without effecting its integrity, the Live Bus passes through one module to the next. Therefore the removal of a Live Bus module may potentially disrupt other modules, depending on its position in the data chain.

When fault finding Live Bus problems the same principles can be applied, as the following example shows. During a mix you suddenly notice that the channel meters in Bay 1 are all showing random patterns of illumination.

As always the first step is to refer to the AWS Control Block Schematic. From the diagram you can see that Live Bus data from the CPU passes through Bay 2 and 3's Channel Meter Panels before reaching the Meter Panel in Bay 1. As the channel meters in Bay 2 are functioning correctly, you can rule out the CPU and Bay 3's Meter Panel as potential causes of the problem. This leaves three potential causes. The first is that the data ribbon connection between the two panels is not seated correctly. The second is that the input stage to Bay 1's Meter Panel is faulty. The third is that Bay 2's Meter Panel has a faulty output stage.

To eliminate the first possibility, power down the console and re-seat the 16-pin IDC connector between the two panels. Re-power the console and check the condition of the fault. As in previous examples, we will assume that this did not resolve the problem. The next possibility to eliminate is that one of the Meter Panels is faulty. Power down the console and swap Meter Panels between Bays 1 and 2. Re-power the console. If the panel originally in Bay 1 was faulty, then neither Bay 1 or 2's metering will now function. In this cause you should revert to the original configuration and replace the faulty panel. If, however, the problem was due to the failure of Bay 2's Meter Panel output stage, then you should find that all your meters are now functioning correctly. As Bay 1 is not required to buffer data onto another panel, this fault will not effect the operation of the console and can be left in this position allowing you continue working unhindered.

Replacing Modules

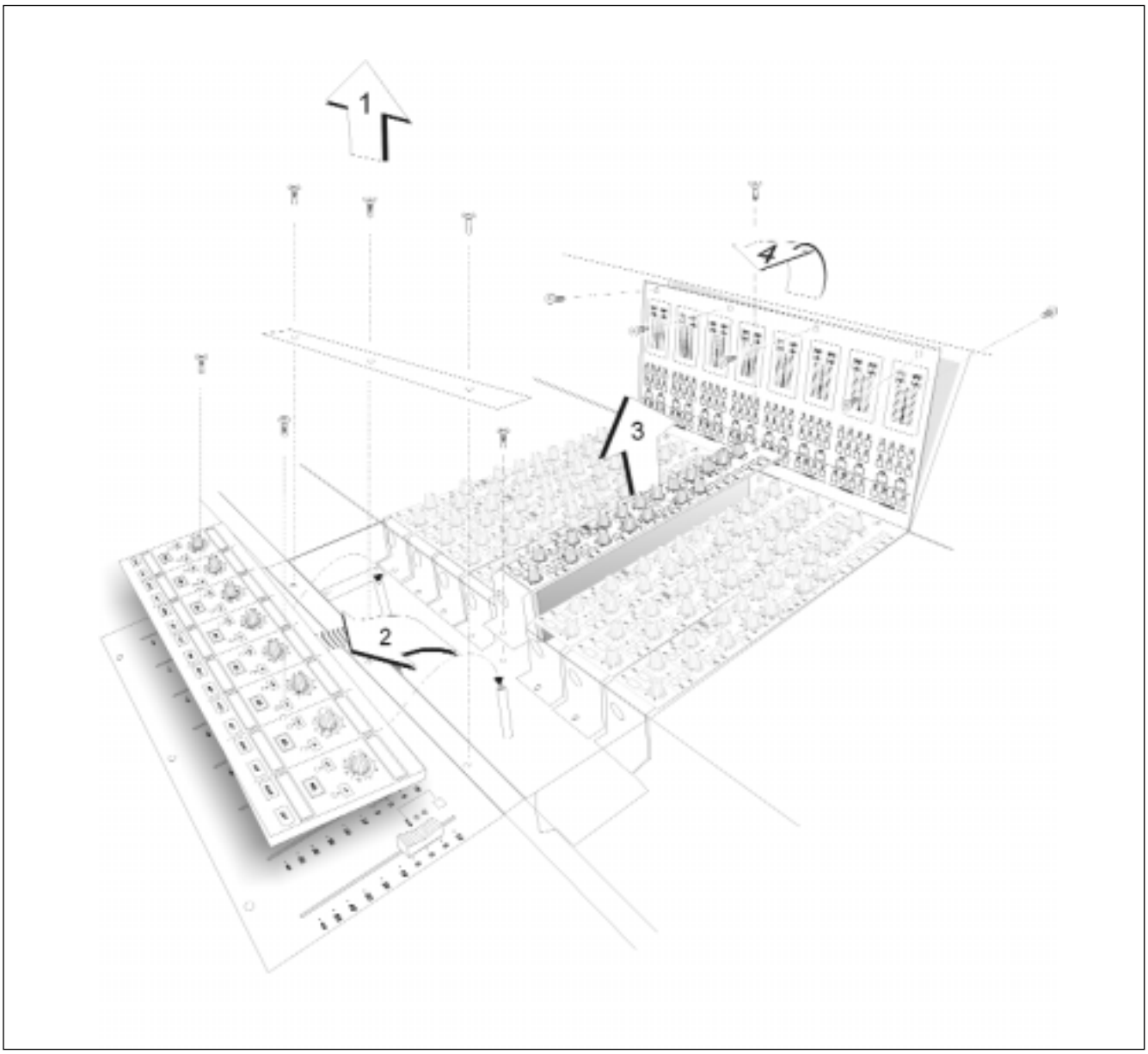
Having identified the source of the problem, you are now in a position to replace the faulty part. If you purchased an AWS 900+ spares kit, then locate the relevant assembly and follow the replacement instructions below. If, however, you do not have a replacement card to hand, you should contact your local SSL distributor who will be able to supply you with a replacement.

The channel and centre section modules can easily be removed from the console for replacement, but first you must disconnect the console from its AC power source. Before turning off the power, make sure that you switch off, or overpatch, all monitor sends. If you power down the console with any of these connected, the DC thump generated could potentially damage your monitors.

IMPORTANT

The console's AC Line Power unit is mains powered, and is not transformer isolated. This unit generates DC voltages up to 360V. This voltage is sufficient to be lethal. Always ensure that the power cord is physically removed from the power inlet before attempting any maintenance.
Removal of modules while power is applied to the console will almost certainly result in component failure.

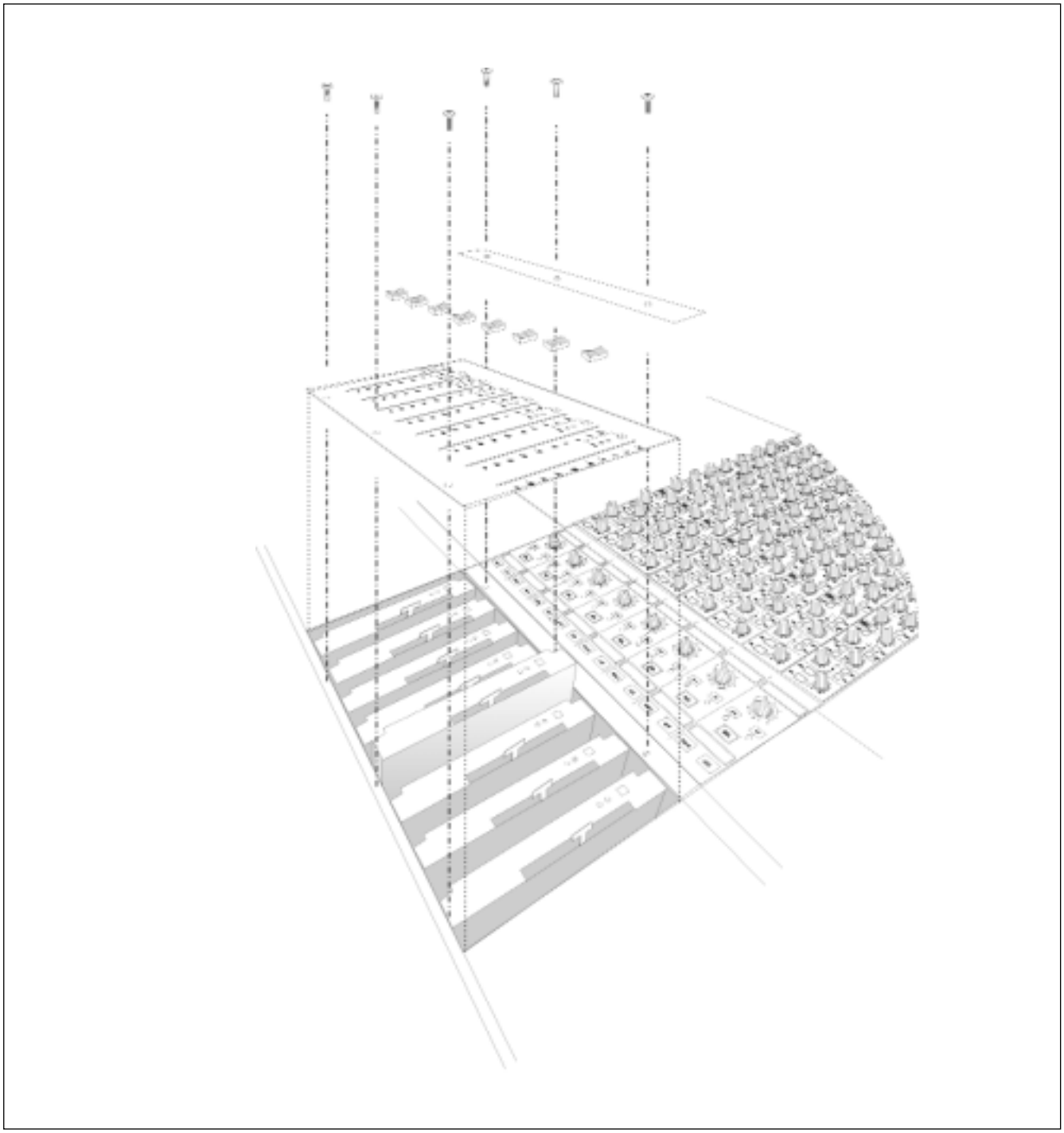
The Channel Strip (629921X1)



First, remove the scribble strip (three screws). Now remove the Solos and Cuts Panel (629922X1) that fits across the bottom of each bay of eight channels; remove the two countersunk screws, then carefully lift the panel clear onto a piece of foam or bubble wrap. Disconnect the ribbon and put the panel to one side.

Each channel strip is connected to the frame of the console by three screws – one at the top next to the meters, one at the bottom (revealed when the Solo and Cuts Panel has been removed) and one at the rear of the console just above the channel's XLR connectors (you will have to look carefully to find this one). When the screws have been removed, screw the module puller into the top hole. Using both the puller, and the finger hole next to the bottom screw, pull the channel strip clear from its edge connectors.

The Channel Fader (629924X1)

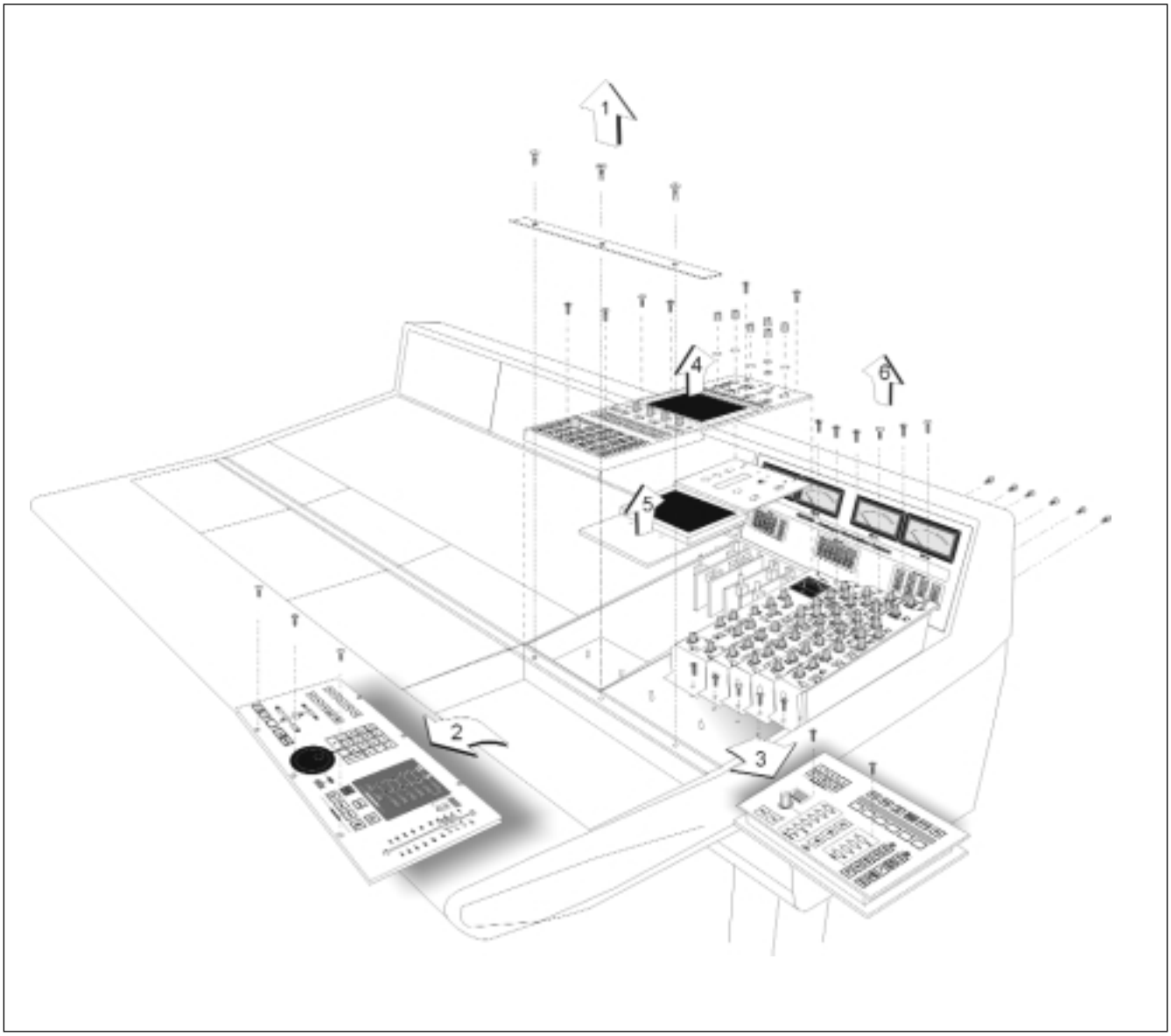


First remove all of the fader knobs from the faders in that bay. Do this by simply pulling firmly on each one until it separates from the fader tang. Then, unscrew the six countersunk screws and remove the top plate. Each fader can then be lifted clear from its connector on the bus card. When reassembling, the top plate has locating pins that locate into each fader to ensure its correct positioning.

The Channel Meter Panel (629923X1)

First remove the top trim by unscrewing the five screws that secure it to the console frame, and lift it clear. Now refer to the illustration on page A-10. Each meter panel is secured by four screws across the top. Remove these and lift the meter panel clear, taking care to disconnect the ribbon connectors.

Centre Section Cards



Four centre section cards are located beneath the large panel that contains the Talkback and Oscillator controls, LCD display, and DAW soft keys. These are:

- 629651X1 6-Track Select
- 629652X1 2-Track Select & Monitor Inserts
- 629653X1 Gain and MDAC control/ Talkback and Listen
- 629654X1 Monitor Outputs

To access these cards, first remove the knob caps from the six rotary controls in the oscillator, listen mics etc. area. Now remove the four screws from the panel. Lift this panel onto its side, taking care not to damage the ribbon connecting it to the Motion Control panel. Beneath the panel is the metalwork containing the LCD screen. Unscrew the two screws at the bottom of this and lift it to one side. The cards are in numerical order from left to right: 651, 652, 653, 654.

The remaining five audio cards can be removed in a similar way to the channel strips. In order, from left to right, they are:

- 629928X2 Centre Section Compressor/Mix/Rec/Foldback
- 629918X1 Dynamics 1
- 629918X2 Dynamics 2
- 629919X1 8-Track / Echo Returns
- 629919X2 Aux Bus / Echo Returns

Note: The two Dynamics cards (629918X1 and X2) are electronically identical. Three links (LK1, LK2 and LK3) are fitted to Dynamics 1 to differentiate between the two modules. For fault finding purposes the two Dynamics cards (629918X1 and X2) may be swapped with each other. When exchanging the two modules ensure that only the module fitted in the Dynamics 1 slot has links LK1, LK2 and LK3 fitted.

Troubleshooting Chart – Channel bays

Problem	Check	Solution
Channel Meter Panels do not function correctly.	Are the ribbon connectors in the rear of the Meter Panels seated correctly?	If no, re-seat as required.
	Swap Meter Panels 1 and 3. Do the meters in Bays 2 and 3 now work? Note: Channel Meter information from the CPU is buffered through Bay 3's Meter to Bay 2 and then on to Bay 1.	If yes, replace the Meter Panel in Bay 1.
	Remove the Meter Panel in Bay 3. Remove the screening can fitted around the processor. Check the ribbon connection in socket PL6.	If no, re-seat as required.
Solo and Cuts Panel in one bay does not function.	Is the ribbon connector on the rear of the panel seated correctly?	If no, re-seat as required.
	Check fuse FS1_4V on the 626630X1 Fader Buscard.	Replace as required – replacement fuses are supplied with the console.
	Swap the problem panel with a working panel from another bay. Does the problem stay in the same bay?	If not, replace the Solo and Cuts Panel.
	Are the ribbon connections to the fader bus card in the bay displaying the fault seated correctly?	Re-seat as required.
	Swap the fader bus card in the faulty bay with a known working bus card from an alternate bay. Does the problem stay in the same bay?	If no, replace the fader bus card.
Raising the Channel Fader gives no increase in channel gain.	Swap the fader with one from an adjacent channel. Does the problem follow the fader?	If yes, replace the fader.
	Swap the channel strip with an adjacent channel. Does the problem follow the channel strip?	If yes replace the channel strip.
All channel strips in one bay do not function.	Refering to Control Overview diagram, ensure that the Multidrop Bus connector between the Channel Backplane and the CPU is seated correctly.	Re-seat as required.

Troubleshooting Chart – Centre section

Problem	Check	Solution
Motion Control Panel does not function.	Is the connector labelled IN on the Motion Control Panel seated correctly?	If no, re-seat as required.
Workstation Panel does not function.	Is the connector labelled WSINOUT on the Workstation Panel seated correctly?	If no, re-seat as required.
	Is the connector labelled WSINOUT on the Motion Control Panel seated correctly?	If no, re-seat as required.
Monitor Panel does not function.	Is the connector labelled MONINOUT on the Motion Control Panel seated correctly?	If no, re-seat as required.
	Is the connector labelled MONINOUT on the Monitor panel seated correctly?	If no, re-seat as required.
GPIO port does not function.	Is the connector labelled PL2 on the Motion Control Panel seated correctly?	If no, re-seat as required.
	Is the connector labelled MONINOUT on the Motion Control Panel seated correctly?	If no, re-seat as required.
	Is the connector labelled MONINOUT on the Monitor Panel seated correctly?	If no, re-seat as required.
Video Display does not function.	Remove Workstation Panel. Remove display panel. Is the 30-pin ribbon connector seated correctly?	If no, re-seat as required.
	Is the connector labelled DVIDEO2 on the CPU card seated correctly?	If no, re-seat as required.
Centre Section meter does not function.	Is the connector labelled IN on the Meter Panel seated correctly?	If no, re-seat as required.
	Is the connector labelled PL11 on the CPU seated correctly?	If no, re-seat as required.

Glossary Of Terms

Analogue Focus Mode	Channel faders control the channel audio; channel meters show analogue input levels. Channel Rotary Encoders control DAW parameters.
Bass Management	A system designed to ensure that all the bass recorded on your DAW tracks is reproduced correctly on the monitor speakers. Put simply, bass content below the cutoff frequency of the main monitors is combined and fed to a subwoofer, thereby effectively extending the response of the main outputs.
Channel D-Pot	The rotary controls on the channel Solos and Cuts panels.
Console Focus Button	The button on the Master Control Panel that looks like this: It selects Analogue or DAW Focus Mode.
DAW Focus Mode	Channel faders control DAW fader levels. Channel meters show DAW meter levels. Channel Rotary Encoders are available for other DAW functions such as pan or send controls.
Master Control Panel	The panel below the screen and soft key area.
Master Send D-Pot	The only knob on the Master Control panel – used to cycle through available sends. Also incorporates a 'push to flip' function used to flip send levels from the rotary encoders to the channel faders,
Plug-in Editor D-Pots	The four rotary encoders below the TFT screen.
Track Busses	Eight console-wide mono busses that can be used as feeds to your DAW inputs, as FX sends, or pretty much anything else you can think of.

Link Options

There are a number of internal link options that may require adjustment. Refer to page A-14, 15 for information on accessing the relevant PCB.

629653X1/2 S/A GAIN & MDAC CONTROL / TB & LISTEN

Link	Position	Default	Function
LK6	Fitted	•	0V to 0VA
LK1	A	•	Ext TB Mic input has 48V phantom power
	B	-	Ext TB Mic input has no phantom power
	C	-	Ext TB Mic has 1.5V phantom (for electret microphones)
LK2	1-2 (Left)	•	Ext TB Input balanced
	2-3 (Right)	-	Ext TB Input pin 3 grounded (for use with electret mic)
LK3	A	•	Listen Mic input has 48V phantom power
	B	-	Listen Mic input has no phantom power
LK4/5	1-2 (Right)	-	LFE 80Hz hi-pass filter rolls off at 12dB/octave
	2-3 (Left)	•	LFE 80Hz hi-pass filter rolls off at 24dB/octave
629653X2 only			
LK10*	1-2	•	Surround feeds LFE when Bass Management is On
	2-3		Surround does not feed LFE

*Use in conjunction with LK12 on 629654X2 card

629654X1/2 S/A MON OUTPUTS

Link	Position	Default	Function
LK7	Fitted	•	0V to 0VA
LK1/2	A	•	Left 80Hz lo-pass filter rolls off at 12dB/octave
	B	-	Left 80Hz lo-pass filter rolls off at 24dB/octave
LK3/4	A	•	Right 80Hz lo-pass filter rolls off at 12dB/octave
	B	-	Right 80Hz lo-pass filter rolls off at 24dB/octave
LK5/6	A	•	Centre 80Hz lo-pass filter rolls off at 12dB/octave
	B	-	Centre 80Hz lo-pass filter rolls off at 24dB/octave
LK8/10	A	•	Left Surround 80Hz lo-pass filter rolls off at 12dB/octave
	B	-	Left Surround 80Hz lo-pass filter rolls off at 24dB/octave
LK9/11	A	•	Right Surround 80Hz lo-pass filter rolls off at 12dB/octave
	B	-	Right Surround 80Hz lo-pass filter rolls off at 24dB/octave
629654X2 only			
LK12*	Fitted	•	Bass management switches Hi Pass filters in to surround
	Not fitted		Surround Hi Pass filters disabled

*Use in conjunction with LK10 on 629653X2 card

Environmental Specification

Temperature

Operating:	5 to 30 Deg. C
Non-operating:	–20 to 50 Deg. C
Max. Gradient:	15 Deg. C/Hour

Relative Humidity

Operating:	20 to 80 %
Non-operating:	5 to 90 %
Max. wet bulb:	29 Deg. C (non-condensing)

Vibration

Operating:	< 0.2G (3 - 100Hz.)
Non-operating, power off:	< 0.4G (3 - 100Hz.)

Shock

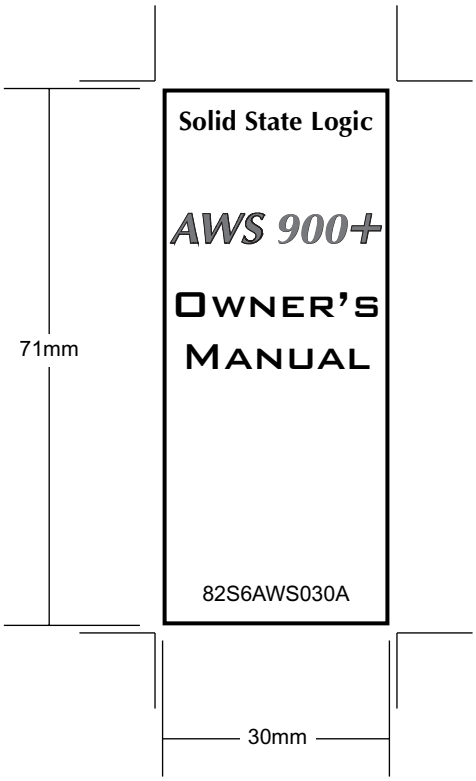
Operating:	< 2G (10mSec. Max.)
Non-operating:	< 10G (10mSec. Max.)

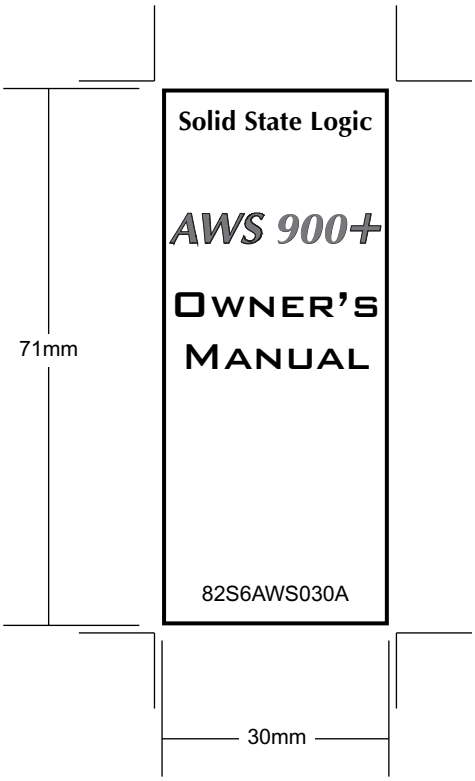
Altitude (above sea level)

Operating:	0 to 3000m
Non-operating:	0 to 12000m

Block Diagrams

Following this page you should find four block diagrams. Two show signal flow in the AWS 900+ channel strip and centre section; two cover the power and control circuits. If any drawing is missing, please contact your local SSL distributor for a replacement.





Fonts

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